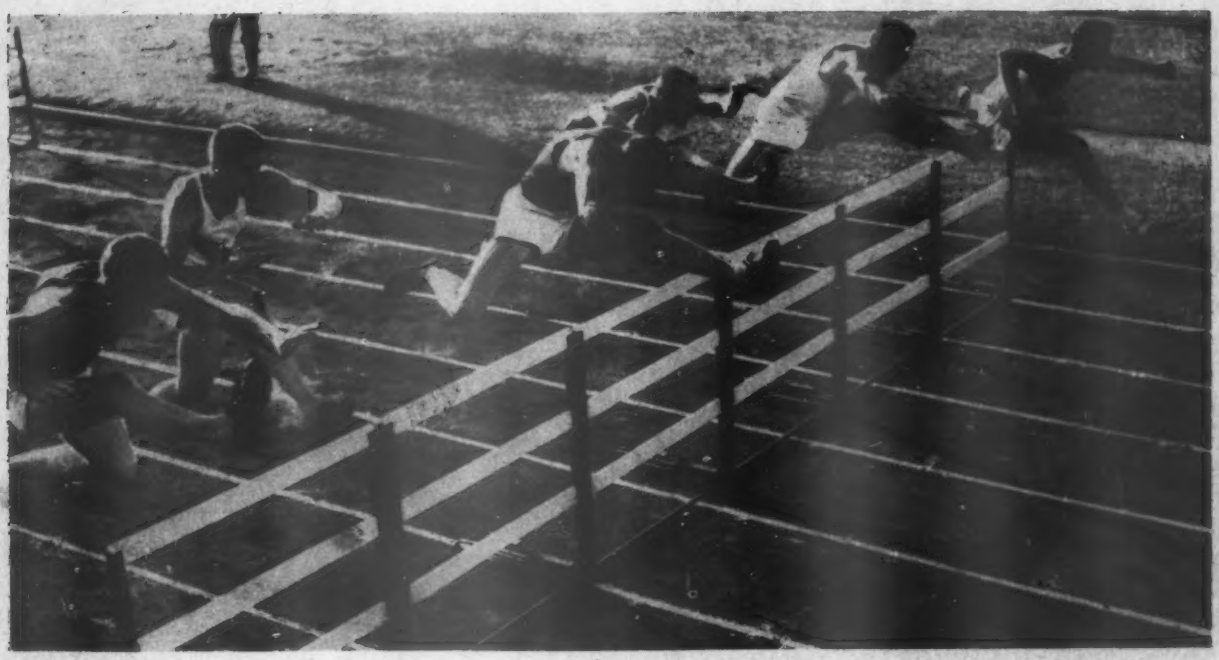
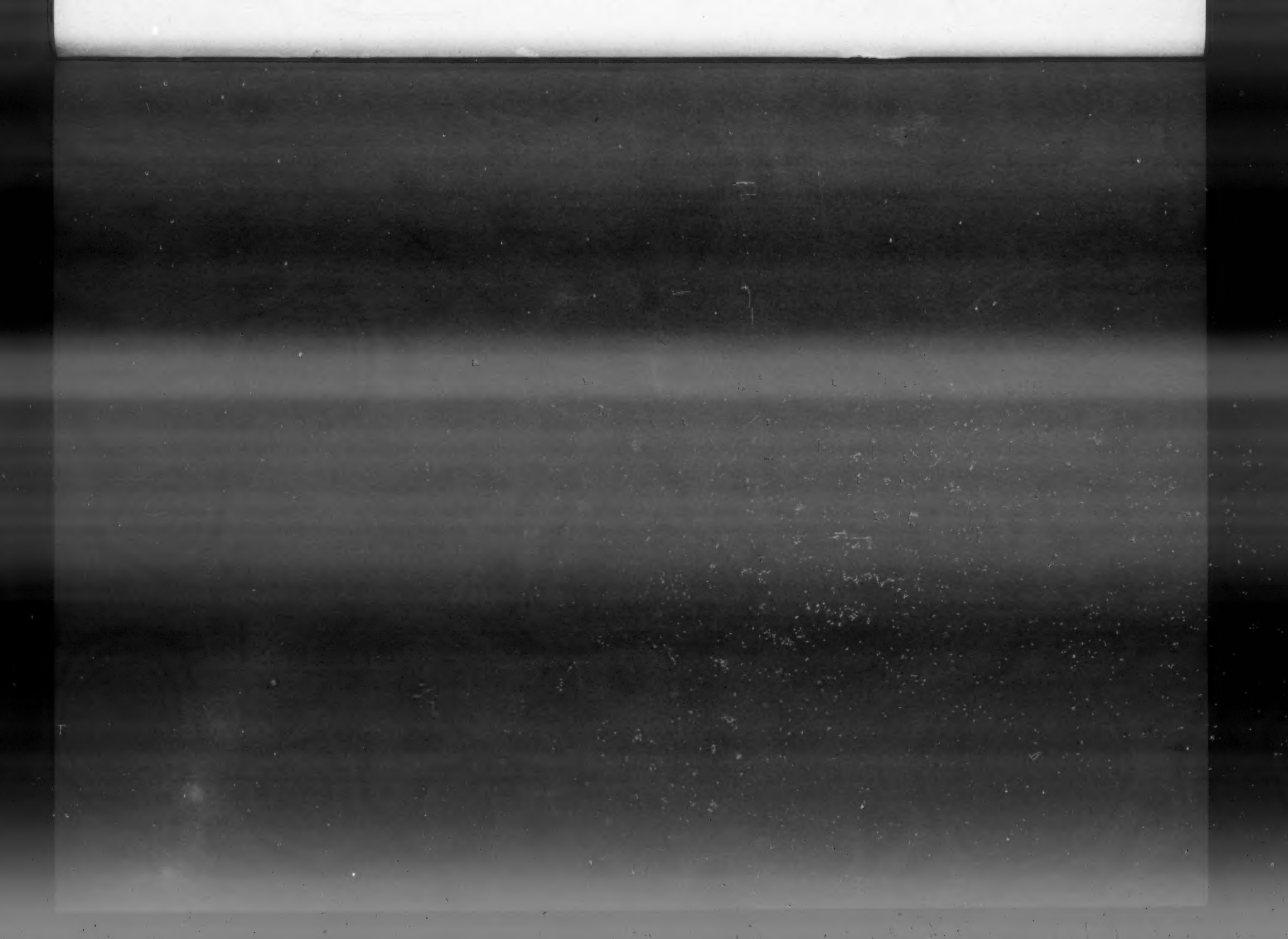
THE PAN AMERICAN TRACK & FIELD JOURNAL



1960

CLINIC NOTES

The National Collegiate Track Coaches Association



The National Collegiate Track Coaches Association

NOTES

of the

THE PAN AMERICAN GAMES CLINIC.....CHICAGO, ILLINOIS

AND

THE 30th ANNUAL MEETING OF THE N.C.T.C.A.....LINCOLIN, NEBRASKA

EDITING, DESIGN & LAYOUT

by

Don Canham

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PREFACE

This is an annual publication of the National Collegiate Track Coaches Association of the United States. It is the complete report of the 1959 Pan American Games Track and Field Clinic, as well as the results of the clinic held at Lincoln, Nebraska during our National Championships. In addition, the Editor has selected reports from other sources for inclusion in this Pan American Journal. The following pages represent the latest available views. In some instances, exceptional material is offered for the first time.

A sincere debt of gratitude is owed to many who made this publication possible. Although it is difficult to list all of them, we must single out a few for special mention. Larry Snyder of Ohio State University did a wonderful job of organizing and conducting the Pan American Games Clinic. Frank Sevigne of Nebraska held an excellent clinic during the N.C.A.A. Meet. The U.S. Pan American Games Committee was very generous in financing the clinic, and also in granting the N.C.T.C.A. the right to publish the results. Ted Haydon of the University of Chicago had his guiding hand in everything concerning the Pan American Games, including the clinic, and without his help this publication would not have been possible. A mention must go to Gail Green, who edited manuscripts, making us sound a little more literate. Herman L. Masin of Scholastic Coach and Jack Griffith of the Athletic Journal as usual granted permission to use their photographs. To them a special "thanks." Phil Diamond, our Secretary-Treasurer, performed his usual competent job of handling correspondence and heading membership drives for the N.C.T.C.A.

A final word must be said about the National Collegiate Track Coaches Association, an organization devoted to the promotion of Track and Field, membership in which is open to all. Dues are $6.00 per year for college coaches and $4.00 for others. Members receive monthly the Track and Field News, and once a year they receive the clinic reports of the N.C.T.C.A. Members as of January 31, 1960 have received this book free as part of their membership. You may join by sending your check.

Don Canham
Executive Vice President
National Collegiate Track Coaches Association
Track Coach, University of Michigan
Ann Arbor, Michigan, U.S.A.

Title

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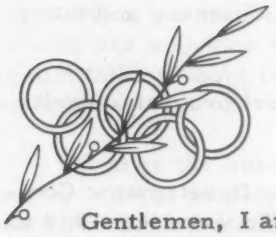


By: Kenneth L. "Tug" Wilson
President, U. S. Olympic Committee

Gentlemen, I am pleased to welcome our foreign visitors and United States coaches to this first Pan American Track and Field clinic. I know you will all receive a great deal of information here that will assist the development of this grand sport in all corners of North and South America.

I am particularly interested in developmental programs and would like to talk to you today about our own Olympic Developmental Program.

The Olympic Development Program was brought about because many coaches though something had to be done if we were to keep pace with the other countries of the world, not only in track and field, but in the many other sports in which we indulge in Pan American and Olympic competition.

Since our start in Olympic endeavors, world conditions have changed. We now find that a great deal of the athletic program is nationalistic in scope. Unlimited money is thrown into it, sometimes for reasons of propaganda. The need for better competitors and the need for stronger people in a nation are emphasized all over the world. Consequently, the impact has come down to the athletic programs. We have had to meet that emphasis in the United States.

I was honored by being elected President of the United States Olympic Committee in 1953. Up to that time it seemed that all we did was collect money, try to give the kids on the teams the best possible advantages we could give them, select good coaches, go through the Olympic effort, breathe a sigh of relief whem we got the kids all safely home and then forget about it until the pressure started on the next Olympiad.

Our Olympic Committees, especially track and field, have been on our backs for some time. Although we were still supreme in this sport, other nations were spending vast amounts of research money and, frankly, they were catching up to us pretty fast.

In 1948 we began feeling a little of the impact of this. In 1952, at Helsinki, we felt a lot of it. It was only due to the fact that our teams, especially in track and field, just performed over their heads and we were able to come back with such a fine record.

Russia made its presence felt there as did Hungary, Germany and many other countries.

So, in 1956, when figuring out the whole Olympic sport program results, we found that the world had caught up in many areas.

So we have tried to institute what we call the Olympic Development Committee. Large sums of money were donated to the cause. We were thus able to ask each sport committee: What can we do? How can we help? Do you need clinics? Do you need coaching and international rules changed like we did in wrestling? Do you need more competition?

In other words, we wanted to give our youngsters the very best opportunity, not only to reach the kids that have shown Olympic and Pan American ability, but to get clear down to the grass roots of the country to instill Olympic ideals and spirit in these youngsters to help get them going.

Any of you who have traveled abroad; any of you who have seen these vast programs which are being conducted can readily see we have a challenge. Unless we do reach the youngsters of this country and create much greater interest we are gradually going to slip from our present position.

I have been honored in being asked to work with President Eisenhower's Committee on Fitness. The Committee was given direction to study the true situation and find out if our youngsters had lost the competitive spirit, and, if so, where the fault lies. Whether apathy is due to the mechanized age or whether it is because the kids have become a little blase. Nobody really knows. We all may have our own ideas.

As a kid I used to drive an old horse eight miles to get to a place where they played baseball on Sunday. I have been President of the Evanston Bureau of Recreation for a number of years. We have fine playgrounds and they are well staffed yet we see that they are not used very much. I have had letters from many high school coaches who said, "Our squads aren't so big because the kids have shown a desire to stay out and work", which is laudable, but their purpose - - in my book - - is not. It is so they can get a "hot rod" or some other material thing. This is not a healthy sign for the athletic future of the United States.

Gentlemen, despite all of these warnings and problems, I think we have the greatest bunch of kids in the world. I think they <u>have</u> the competitive spirit. I think maybe <u>we</u> have fallen down in providing competition on the lower levels - the grass roots level. The reason those kids haven't competed is because we haven't given them enough opportunity. We must do more.

What we have to do is put this competition on a level where every kid feels he has a chance to do some good. We must inspire him and through preaching and talking about the Olympic ideals maybe we can get someplace with the youngsters.

And so the burden, as it is will all executives, passes from one level to another until it gets down to the most important level - - and that is you - - because you have the contact with the kids. You are the guy who is going to inspire them, the guy who is going to keep them out.

We can do just so much. We can hold out to them what we might call the "World Series in Track" - - these Pan American and Olympic meets, trips to Europe, and all that but if they don't see an opportunity to get into the competition at a lower level, then we are in trouble. That is the desire of the Development Committee.

We have had some tremendous steps taken in some of the sports. Let's take the gymnastics. When I saw over a thousand gymnasts down in Florida this winter where we had the Finnish team, where we had good teachers, where kids came down on their own, I realized it wasn't the lack of ability or desire. It was the fault of those who are in charge of the athletic programs. They have not provided the opportunity.

Take soccer football. If you read our record in the Olympics you know it is terrible in this sport. Once in a while we have a few good individuals. Well, how are we going to meet that? We will meet it by trying to get more of our colleges and universities to play soccer football. Whether it is an intermural team, a class team, hall team or what-have-you, let's get them playing and then let's get these kids together and see that they have an opportunity to get the best coaching and then competition on the highest level.

Then, in wrestling year after year, Olympiad after Olympiad, we sent a team over to compete in the Greco-Roman style in wrestling when some of the kids didn't even know what it was. It is so vastly different from our style.

Sure, we want to have a wrestling team, but that is no way to build a team. Consequently, at the present time (this week) we are having a wrestling clinic where we have the best coaching we can possibly get in that style of wrestling. This should have been done long ago, but now we are making progress in wrestling, too.

I could go on and on and tell you more of these things, but let's come down to this sport of track in which we have been dominant.

At Melbourne I sat with the Runnian President of the Olympic Association and he said, "Mr. Wilson, I don't understand your country." He spoke very fine English. I said, "What do you mean?" He said, "Well, in Helsinki you had five gold medal winners in boxing. Within a year, they all turned professional. Why did you let them do that?"

I said, "In our country, we don't tell them. They just compete. It is their business." And I will never forget the Russian as he looked at me a little bit and said, "Mr. Wilson, it will only be a short time until we will beat you in everything."

Well, I don't know. I will take my chances with the kid who competes not because he is told he must compete, but because he loves to compete.

But I do see this: That if, for instance, we don't encourage youngsters in the hop-step-jump, javelin, discus throwing and distance running - - if we can't get more interest, we are not going to look so good in the future.

There is a difference in youngsters and in competitors. I think of one zero afternoon at Cortina, Italy, when I was over there watching the Olympic winter sports. Our hotel was two and a half miles from the ski jumps. The Russian hotel was about three miles, perhaps three and a half. Our kids stood there time after time half-frozen waiting for a taxi to take them back to their hotel. The Russians got through their competition, put their skis on their backs and maybe one of them would pull out a bottle of Vodka and they would take a "hooker" and then they would go down the road singing and maybe stopping to wrestle and fight a little bit; while our kids were there huddled together and shivering while waiting for a cab to take them back to their hotel.

Well, I don't say that is a lack of desire. It is just a different type of rugged attitude that we have to meet. This is something, I think, that every one of us is so damned interested in that we ought to give it serious thought.

In conclusion; We hope that you will see these great performers in action and that you will feel free to ask questions, and maybe from meetings like this we can accomplish something. There are, right now, I think, 14 Clinics being held in conjuntion with the Pan American Games. We can hold these meetings in the guise of Clinics. We can't under Olympic and Pan American rules, keep our kids together all summer in a camp and say, "Now here, Bud, you are here and you are going to stay here. Forget your work and other troubles." We don't do that. I hope we will never resort to those tactics, but maybe we can inspire the youngsters of our nation and maybe we can get them into the feeling, "Well, let's give this a try."

Maybe we have to work out different classes like the English have done

and like the Russians are doing. Maybe we have to award these 9 or 10-year old kids with some badge, if they earn it, and then see that they go on up through all the stages until they become Pan American and Olympic competitors.

I can tell you, having competed in one Olympic Game and having seen practically all of them since 1920, I can see that intense wave of competition coming throughout all the world. Somehow, it seems we are often just standing still.

I wouldn't say that of all sports but it seems we have lost maybe a little of the desire. Not the desire to compete so much as the desire to improve - - a desire to improve ability.

Each coach here knows it takes simply hard work and that very few kids are so endowed that they can simply put on a pair of shoes and go out and start winning medals. It takes hours of hard work and, gentlemen, it takes hours of patience on your part to keep working with those kids. You have to make them feel they are important, make them feel we need them and your reward, some day I hope, will be great.

I won't take any more of your time now because I know that you have a fine program ahead. I do want to congratulate all who had anything to do with this clinic and I thank you for asking me here.

THE WINNING ATTITUDE

By: Jesse Owens
Illinois Youth Commission

Coaching, as you all know, involves a great deal more than knowing a great deal about the human anatomy. The attitude or the personality of the particular individual you are dealing with will make much difference. Some boys you are going to have to talk to in a rough manner. Some you don't say anything to. Some you handle with kidskin gloves. It is a matter of knowing the individual you are coaching.

I don't give a tinker's damn for a boy who doesn't have the feeling that his stomach is going to fall out just before he steps to the starting line. If he has that nervous feeling when going to the starting line, then he has a very good chance of having the right attitude.

I think if I were coaching a team today and trying to bring my boys around to the right attitude I would try to have them recognize that here is a sport that is going to require a great deal of time. He must know that. Track and field is very exacting, as you know, gentlemen. If I were coaching I would not let any of my boys play basketball. I wouldn't let him play baseball, nor would I have him up on the football team. because as you know, every muscle in the body, as far as track and field is concerned, is a long leg muscle and is built for speed.

The splitting of seasons is going to hinder that boy in track and prevent him from giving his best in any running event. He must be taught this early.

Oftentimes, gentlemen, you have no one to assist you in your coaching and you have 35 or 40 boys to coach. I can recall back in 1935 or 1936 prior to the final tryouts for the Olympic Games. I was working up in Princeton University. Coach Snyder had worked us up to the point where we were ready for the final trials. During that week of training I felt that the coach was not giving me enough time, as an individual. I did something that day that I have been sorry for ever since, and any time I talk to youngsters in high schools today it is one of the things we talk about, and that is their attitude toward their coach. I blew up that particular day. I walked off the field.

Here was the coach trying to help Dave Albritton, Mel Walker and others, and I was getting the attitude that I was the individual with whom he should be working. He had worked me to the point where I was ready. Not knowing that, at that particular time, I blew up on the field.

As I approached the final tryouts for the Olympic Games coach again completely changed my attitude, simply ignored my previous display.

I do think, gentlemen: That as coaches we should talk more to the youngsters about attitude. We are all striving for victory. As we train, we train for the idea of being the first at the tape." We must relize that attitude plays a great part in victory."

There is a danger, too, for the person who is able to win quite often. He often takes a great deal of things for granted and then he begins to think in terms of the newspaper clippings and what the people write about him. The individual begins to think about how great he is, and he is going to lose that itch. It is much better if you can keep athletes away from reading the papers. Gentlemen, just don't teach them to read! Attitudes are thus formed by writers as well as coaches.

It is difficult when a boy gets thinking he is going to win at all times, for then he is usually beaten. He has to know how to take his lickings and count the mistakes he made in losing that particular race. When you sit down with him and go over the mistakes of that particular race, you are building the proper attitude in this situation. In your dealings with him you can restore that winning attitude.

These are the things that I have learned through junior high school, through high school, and which were more emphasized when I went to college. I might say this; Remember Eulace Peacock who was from Temple University? In 1935 we started to run in San Diego, California. It was the beginning of my phobia against this guy. I couldn't beat him. He beat me in the 60 yards, in the hundred meters, and I remember in 1935 when we were out in Lincoln, Nebraska in the broad jump. The boy hadn't broad jumped over 23 feet and I had 26 feet on four different occasions. But, on the last occasion, he jumped 26 feet 3 inches to beat me by a half inch.

I didn't catch up with him until we went to Europe in 1935. He had a pulled muscle, and from there on out, I was able to take care of Eulace Peacock.

My coach often sat down with me and went over the races. We have gone over the individuals we are going to run against in particular. Through his personality, his knowledge of psychology and, knowing me, he was able to restore in me many things I felt I was lacking for a particular race. As coaches should, he helped me form a winning attitude.

Gentlemen, to me, the winning attitude is a matter of two individiuals - - your pupil and you, the coach. You must know his background and a gread deal about him, and you must be able to inject in him some of the things which you know. Remind him of the strength which you know he has. Putting that combination together, you are going to have a boy who is going to have the proper approach. He is going to assume the right attitude and he is going to be the kind of person you can be proud to coach.

Many coaches today do not fully realize the importance of the position which they hold in the community in which they live. Today, as I travel around the country

and meet the youngsters of various communities and talk to them in reference to their coaches, their coaches are more important to them than the superintendent of the school, than the mayor of the town, and he is held in a great deal of respect in the homes from which these boys have come.

That is the unique position which you hold as coach in the community in which you live and, therefore, by injecting into those children the qualities which you have gentlemen, you can produce the winning attitude anywhere you are coaching today.

I can say unshamefully here today that Larry Snyder has been a great morale booster in my life. He has done a good job. We didn't have a lot of material down at Ohio State at the time. We had some hard-working guys. Please believe me, they did everything they could to win. We had trouble with the University of Michigan; trouble with the long-distance runners - - we took care of them in the shorter distances.

Dave Albritton, Mel Walker, Charlie Beatam, George O'Brien, George Moore, and many others on the team when I was there always praised Larry Snyder because of his knowledge of psychology in knowing how to handle them. I know you gentlemen can do the same thing in the community in which you live by knowing your boys as Larry Snyder knew his boys.

Jesse Owens . . .

STARTING A TRACK & FIELD CLUB

By: Ted Haydon
University of Chicago

You heard Joe Mangan and others stress the importance of organizing clubs in the United States similar to the clubs which exist in foreign countries. It is generally accepted that most runners don't reach their peak until long after they graduate from collegiate competitions. Due to the situation we started a Track Club at the University of Chicago. We are going to celebrate our tenth anniversary next fall.

What should be the purpose of a track club? It is my opinion that a track club's purpose should not be to win trophies, to score high in national meets, to beat all other track clubs, or to bring glory to the sponsoring institution or to the coach. I believe that the true purpose of the track club should be to provide an opportunity for people interested in track and field to continue their participation in track and field.

We know that a lot of good athletes don't go to college. If there is no club, the chances of their continuing athletics are less. When a college boy finishes his schooling, if there is no club in his vicinity, what is he to do?

It is my feeling that the purpose of the track club should be merely to provide the opportunity for any out-of-school athletes in the area to continue in track and field and whatever trophies, glories and championships that come from that should be merely a by-product and not the main objective.

The reason I say this is that if you start with the objective of being the best club in the country or winning the championship, you run into a lot of problems which will complicate your club. In the first place, if you want to win a championship, you need everybody in your area. You may send out letters to everybody and try to get them to join your club. If they join, you have a problem because I don't think there is a track club in the country that has the financial support to give all of these athletes all of the opportunities which they would like to have.

Furthermore, if you solicit them, you have to make promises which you may not be able to live up to, which will complicate the picture, because if you don't live up to the promises you make, then you are in trouble with the athletes.

We make no promises. I had a vaulter once who said, "If you get me a new pole and guarantee that I will get to the national championship, I will join

your club."

I said, "I'm sorry, I can't make such a promise. All I can say is if you join our club, we will do our best to get you into the competition you belong in." As a point in that direction, I can say we have always managed somehow to get our men to the meets, but we have never made a commitment in advance to do so. Sometimes these arrangements are effected at the last moment.

So, how do you get your members? The track club at the University of Chicago started because we had the facilities. The first fellow who joined our club who was not a student was Lawton Lamb, the miler from the University of Illinois. He was in the Chicago area; he was enthusiastic and wanted to continue training. He asked if he could train at our place. We told him, yes. As he trained in our place he became acquainted with our varsity runners and we had a track club going which consisted of our varsity team and our alumni who had finished their collegiate competition.

He was our first non-student, non-alumni member. That opened the door to others. We have never gone out and solicited any athlete to join the track club. They know we have the club; that we have facilities. They know we get to meets and they come and ask if they can join.

This is a hardship on some who may not have the courage to come and ask. They may feel they should wait to be invited, but most of the boys who really want to run will come and ask. We don't discriminate on the basis of ability, education, nationality, race, or financial ability. We have no membership dues. The only thing we do, as a gesture to the University, is to pay two dollars a quarter for locker and towel service, which doesn't cover the cost if a fellow trains regularly. It is exactly the same fee which is charged the faculty members at the University. So far, we have had to turn away no one because we have not had that many requests. We have been able to handle them in our facilities.

There are other temptations that you will have if you are trying to build up a championship club. You have the temptation to break the rules. Deacon Jones, from Iowa, has been closely associated with members of our club and he has been very anxious to run with the University of Chicago Track Club because that way he could get into some competition he doesn't otherwise get into. But Deacon Jones is out of our district. If we were set up in a process where we were going to build up a cross-country team, and we have been in competition the last five years, Deacon could help us. We don't have that objective. We don't tell him to come to Chicago for two weeks and establish a phony residence so he can join our club because we feel, once you get into that, you have lost the basic purpose and you have violated basic ethics.

About half of our members live in the area and train in our facilities. The other half are fellows like Phil Coleman. He is located at Champaign. He trains at Champaign. Our contact with him is in the competitions. What do we do for Phil Coleman? We try to serve him in any way that we possibly can. If he is making the Eastern circuits and going to all those meets, we make his plane reservations, handle the checks that come in from the meet promoters, send him his pocket money for hotel and meals, and also the form on which he gives us his expenses and sends back receipts on these expenditures.

In that way, every expenditure that Phil Coleman makes in reference to his travel, or any of our other men who make the meets and are paid by the meet sponsors, all their expenses are carried through our athletic office and an accounting could be given to anyone at any time as to what they were. If they spend less money than they get from the promoter, the money goes into the club. If they spend more money, the promoter or the club backs them up to that extent.

If he needs a pair of track shoes, he can call up and we will try to get them for him. We also sponsor meets which will give the boys a maximum opportunity to compete and get in condition for the larger meets.

One problem in any track club is how do you get to the meets? Some of the meets are far away, and they cost money. We have worked out various systems for doing that. In the first place, we make no commitment to anybody that we can take them to any meet, but they know we are going to try like heck to get them there if they are able to compete in the type of competition the meet represents.

As a sign of our success, we had ten men at Bakersfield. That is a long trip and cost us something like $2,500. in 1958. How do we raise our money? We have a certain basis of support which we got permission to solicit from the Director of Athletics at the University of Chicago. We solicit from the track letter-men back through the years who are interested in track. Since many of our track club boys are actually either students or graduates from the University, this has an appeal to them, and we have raised some money by soliciting them once a year on a low-pressure basis, sending them a report of our previous year's activities and asking them to donate whatever they can.

We have people interested in track and field through-out the city whom we solicit also on a low-pressure basis. When I say that, I mean we send them out and we keep close track of the money that comes in for our bookkeeping purposes, but we don't study the picture to see whether Joe Blow sent something this year or Harry Smith sent something this year. We don't make a big fuss if they do or do not. We don't pressure them with a lot of follow-up letters to make it a big pressure thing.

One device we found successful and which creates good will is when we take a trip like we do to the National Championships we prepare a thank-you letter to the contributors who have helped raise that money and we have all the boys on the team autograph them and we mail them to the contributors.

Some of our contributors have told us this really makes them feel good, and that is the kind of thing that is conducive to continued support.

Another thing we do is we ask our members to help with the fund raising. We ask Phil Coleman to give us a list of people in Carbondale, Champaign or anyplace where he thinks he knows people who might be interested in contributing to send him to the National Championships. When our appeal letters go out we put on the bottom of the letter, "Your contribution will be ear-marked toward the expenses of Phil Coleman." We put that on the letters sent to those whose names he gave us. We do that all the way down the line. Naturally, the boys who want to go to the meets and have the ability to go to the meets are the ones who will pitch in on that kind of campaign.

Once we raised $25.75 that way for Phil - $25.00 from his father and 75 cents from three anonymous contributors of the Southern Illinois University. We have done better in recent years since he achieved national prominence, but some fellows have been able to raise the full load for their own expenses, and then some, if they happen to have the contacts.

We don't tell them they have to raise any certain amount, but when we apportion the funds that we have, we give them full credit for what they have helped raise. We apportion a proportion of the amount of the free funds we have from other sources to each man, and sometimes, then, we have to ask the athlete to dig into his own pocket for the balance. This, we have found, they are willing to do if they feel able and if they feel that they are in contention for the champsionship in the competition.

If we have a case where we know the boy does not have the money, we make exceptions. We have no arbitrary or rigid method of doing this. If we have a kid who has no money, the boys who have money will still pitch in for their own expenses and appreciate the fact that we have to give a larger allotment of the free funds to the boy who can't pay them. So far we have not had any trouble, hassle or disagreement over that.

If your boys get to be good, you can get some help through the AAU and from some of the big meet sponsors who will pay either all or a portion of the travel expenses.

This is a help to any track club. Phil Coleman usually gets some kind of an allotment from the AAU for National Championship meets and when he

makes the Eastern circuit of indoor meets it is of no expense to us because all of the expenses are paid by the meet promoters.

This June or July, we were planning to go to the Canadian National Relay Championship in Toronto. We didn't have enough money. One of the boy's fathers said, "Look, I have a station wagon and I will drive a bunch if you will drive a bunch". So that put the thing on again. Then we said, "We are $250. short". He said, "I will underwrite it and you pay when you have it". He gave us $250. to meet our cash expenses for motels and meals, and when we got through the meet, we had a little money left, which we paid him back. We still owe him $231. He is not pressing us for it because he knows we didn't have it to begin with, and he knows we will give it to him when we have it.

This is the sort of thing that develops as enthusiasm comes. Our boys don't travel first-class. Even if we have money most of the time we travel day coach and it has been a pleasant thing to me to see runners like Jim Golliday and others of national prominence who, when they were at their prime had their full expenses paid to a lot of big meets, flying back and forth, now riding the day coach with the other fellows. We don't send them out in a day coach the day before they run. We try to send them a day earlier on the day coach or else we take them out first class.

After the meet is over it means getting on the trains at 7:30 and sitting in the day coach until 7:30 the next morning (as our boys did last weekend at Buffalo). The boys don't mind it. They play games and enjoy the fellowship involved.

Fellowship is an important aspect of any track club. It is just as important as some of the other results, I believe. Through these contacts, the boys develop and exchange training methods and there is an exchange of social ideas, economic ideas, political ideas, ideas on sex and marriage, and it is a wholesome type of fraternity experience.

As far as training is concerned, a lot of the boys have their own idea about training and we don't try to make them conform to some other pattern.

Some of them will say, "Give me a training program and I will follow that". For those, we do that. Others say, "I think I know how to train. All I need is an occasional suggestion." Some will say, "I know how to train and I don't want any suggestions". Those we permit to run, too.

What are the benefits of such a program, especially if it is a coach who is, perhaps, the central figure around which the thing is organized? What are the benefits to the coach?

I believe it is very difficult for a group of runners (and this has been proven by the rise and fall of many track clubs) - - it is difficult for a group of runners to organize a club and keep it going unless they have some kind of base of facilities and some kind of basic core of personnel, whether it is Joe Mangan with the Striders or McCluskey with the New York A. C. In this case, I am with the University. Coaching track is my business, so this is an added part of that business.

What are the benefits to a track coach in a high school or college who permits the use of the facilities which enables the development of a club, whether it is a large club or small club? One benefit is that your runners have contact with older, experienced runners, and the exchange of ideas is beneficial to the younger runners. It is a great thing for the young boy who may be thinking primarily in terms of winning a letter or getting a little glory, to see an older runner who is not running for a letter. Some may be concerned with glory, but there are others who are not, and they are running because they like to run and they want to improve themselves. It is a wonderful thing for the high school and college boys to see this spirit in the older runners.

In the second place, having these boys around is like having a permanent clinic. The coach is continuously able to learn from the athletes who are participating in the club. If he has a good hot puter, or pole vaulter, or good steeplechaser, or a good sprinter, not only do his boys learn, but he can also learn just from observation and working with these fellows.

I think if you remember the purpose for which it is set up, which is simply to provide the opportunity for the out-of-school runner - - whether it is high school or college graduate - - to keep running, you can realize this type of program can be run in the small town, local community, high school, or in the university.

We would like to see more clubs. Dan Ferris has repeatedly said in the Olympic Development Program that every community high school should be open in the summer so the boys who come home from college and boys who are not going to college can continue their participation. If the institutions will open up their facilities throughout the year, so much the better.

I feel that the club idea will result in improved athletics, improved running, improved material at all levels. It will be a definite benefit to the program of any institution or community in terms of what rubs off on the younger kids and the younger students interested in the sport. It will be of benefit to the coach who has virtually a year-around clinic at his disposal to study and learn the various techniques and variations, of which there are many.

Thank you.

Chairman Snyder: Gentlemen, Joe Mangan is back here. He has the Striders Club in Los Angeles. They won the National Championship. Will you come up a moment, Joe?

Mr. Phil Diamond (Secretary-Treasurer, NCTCA, Ann Arbor, Michigan): May I ask a question?

Chairman Snyder: Yes, that is what I want you to do.

Mr. Diamond: My question is simply this: On these allotments, do you mean you yourself determine that, or do you have a committee that operates, or do you handle the stuff in a public meeting? What is your governing body?

Mr. Haydon: Usually I do it, but by what you might call the "Oriental method" of discussion. We know who has a chance to place, and we try to distribute it equitably with the only difference being based on the ability to pay. The only problem you would have is if you made a mistake and gave a lot of money to a poor guy who wasn't good enough to place and the other fellows had to sacrifice because of it.

I should add one thing: We have some fellows who are not good enough to place who want to go to national meets, and sometimes we make them raise every dime it costs in order to get there. We tell them, "We don't think you can place, and we're not going to give you any of the club money." They accept that.

One thing that helped us a lot was the establishment of standards for entering national meets. Before they set up the standards, we had arrived at a point where we thought we should set up a committee to evaluate our men to see which men rated going to the national meets.

The setting up of standards eliminated that. When they say you have to run a certain time in an event, that eliminates a lot of fellows, and you don't have that problem.

Chairman Snyder: Joe, you have been listening to Ted. Do you have some variations in the manner in which you run your organization?

Mr. Mangan: There are some, of course, First, let me say that I am a hundred per cent with Ted in his concept of preferring a large number of small clubs rather than a few big ones. I would be personally very happy if the Striders could be broken down into three or four clubs around the Los Angeles area. I agree with you it would be better for the sport.

You also commented that they might tend to fall apart. We are a little bit afraid of that, but if you want to break them up, it would be wonderful with

me. I would aid in breaking up a large club.

Two top men could be the first and second dogs of three or four small clubs, where in a large club they are number eighteen and twenty.

Mr. Haydon: There are a lot of administrative details that you can't expect a runner who is training to handle.

Mr. Mangan: That is the difficulty.

Mr. Haydon: Somebody has to do the leg work, and you are doing it out there.

Mr. Mangan: Money is the headache if you are in a position to start a club in your home town or school. Four years ago when we organized the Striders, we were stone broke. Finally, we incorporated. I don't know whether you thought of this, Ted, but under the Internal Revenue Act, contributions to the Striders are tax free on the part of the donor.

Mr. Haydon: The University of Chicago Track Club was recognized as an official group under the sponsorship of the University. Therefore, we get that tax deduction. If we have a real large contribution where there might be some question about it, we can have them give it to us through the alumni foundation and they ear-mark it for the track club. Then they are sure of a tax deduction.

Mr. Mangan: You are in a fortunate position. We were not in that position. If any of you men are interested, the aspect that will sell it is the youth activities program. We adhere to that religiously in order to continue our tax exempt status. We send two or three runners, track men, to camps for youths, camps for delinquent youths, and there is the cultural aspect for youths who are not delinquent. The boys enjoy themselves. It is a real pleasure on a Saturday morning to see 200 kids, ages 8 to 16, out there with four or five Striders putting them through their paces in four or five events the way you do in a P. E. class in a school.

MECHANICS OF SPRINT STARTING

By: Ken Doherty
University of Pennsylvania

With so many authoritative analyses of sprint starting available, one more coach's opinion can hardly hope to offer a contribution to the literature on the event.

The road to practical benefaction lies in another direction, and it is with this thought in mind that the writer would like to dwell on the scientific principles underlying certain aspects of sprinting as deduced from experimental studies and from an all too limited knowledge of anatomy, physics, and physiology.

Though some of the opinions are necessarily arbitrary and subjective - thanks to the complexity of the subject matter - the effort should stimulate a great deal of thinking and lead to improved coaching practices.

Where should the back starting block be placed?

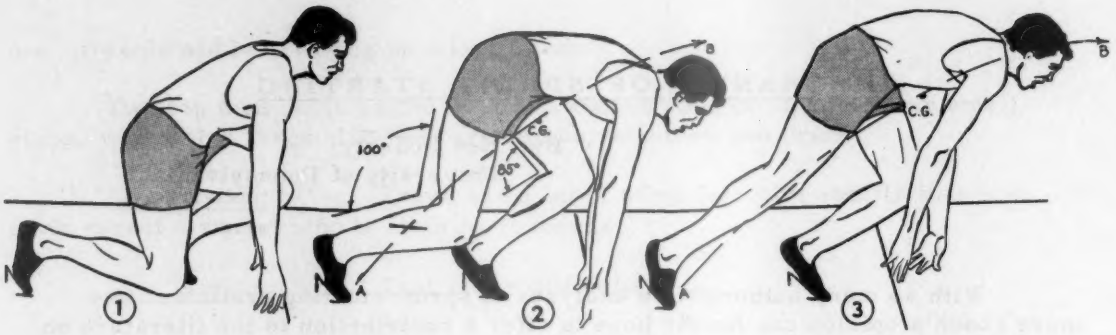
Most textbooks and coaches avoid any specific instruction, but suggest a point between 28 and 40 inches from the starting line. The few and indefinite reasons given are safe-guarded by the suggestion that each sprinter should experiment to find the exact location.

In the writer's opinion, the back block should be so placed that the back leg can build up maximum force as quickly as possible and still provide adequate time in which this force can be applied. Of these two factors, force and time, the recent work of Franklin Henry[1] concludes that the former is the more important.

Slow and fast sprinters do not differ significantly in the length of time the back foot stays in its block. But fast sprinters do build up more quickly a much greater force (averaging 160 lbs. pressure) than do slow sprinters (average: 110 lbs. pressure).

It seems clear that the primary function of the back leg is to initiate action as powerfully and quickly as possible rather than gradually building velocity, as might occur if the foot were close to the starting line.

What block placement, then, will provide the greatest force against the block? No studies are known to the writer which deal directly with this specific

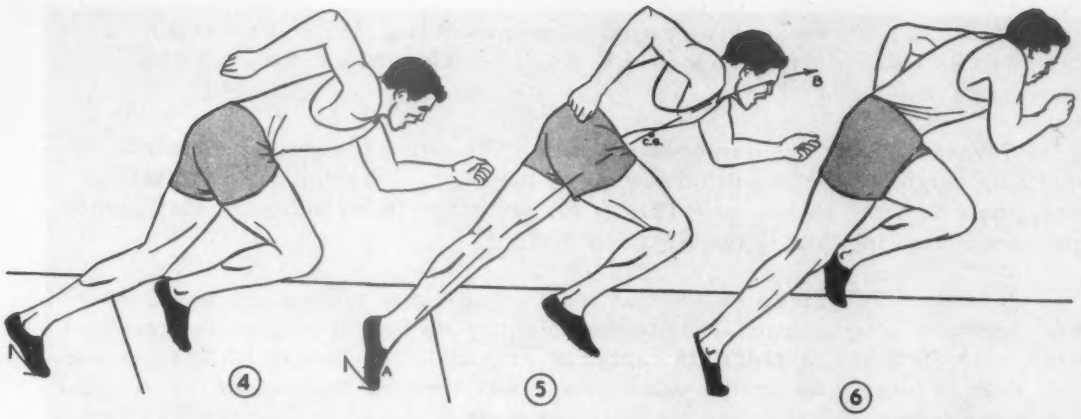


Excellent form in sprint start as defined in accompanying article (illustrations adapted from drawings in Ken Doherty's book, Modern Track and Field).

Position 1: Athlete is relaxed and well-balanced with weight resting primarily on back knee and front foot. This rests fingers but necessitates a swing forward and up when getting set, thus making set position a little less certain. Eyes are focussed on a spot not more than 10' away.

Position 2: While eyes and head are unchanged, shoulders are now well ahead of starting line - - as far as good balance in Positions 5 and 6 will permit. Height of hips has also been established in terms of balance in Positions 5 and 6. The faster the man, the longer the stride; and the more intensive the practice, the higher and more forward the hips can be placed at "set." The overall direction of force, as in all these figures, is along line A-B, as established by base (right foot in Positions 1-3, left foot in Positions 4-5) and center of gravity (c. g.). Angle of back knee is close to 100°, which establishes correct position of back block. Angle of front knee is close to 85°, which establishes correct position of front block. This statement is crucial to article's point of view. Incidentally, blocks are placed in so-called elongated or "orthodox" start. (Called "orthodox" because from 1920-35 it was accepted method. Since then, thanks to research of Bresnahan and Tuttle, it has proven less popular, but through later work of Henry it will undoubtedly return to wide acceptance.) For this particular individual, block separation is about 20", but basis for this measurement lies in knee angles and position of c. g. , rather than in arbitrary placement of blocks.

Position 3 is close to perfection. Overall direction of force is down track at about 30°, rather than up and out. Position of eyes and head is unchanged relative to torso. Left hand is first to move and is driving low and straight ahead toward its position in 4. One of the worst and more common faults in starting is to lift lead hand up close to head so that body straightens almost immediately. At moment rear foot gets its final push from its block, angle of front knee will be just over 100° (angle of maximum power).



Positions 4 - 6 can be examined together. Sprinter seems to have straightened his running angle too soon. In Position 6, he's already close to 45°, which ideally shouldn't be reached until at least 10 yards out. Arm action is perfect. Back drive of rear arm has been emphasized, aiding forward lean, and full, natural stride has been achieved, preventing stumbling. Eyes are still down, though gradually lifting toward horizontal. In summary, one has the impression of relaxed quickness rather than all-out effort.

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How far forward beyond the starting line should the shoulders swing and how high should the hips be raised when getting "set"?

Several effects require consideration. To swing the weight forward, even though high, puts the unit of power - - the legs - - behind, rather than under, the weight to be moved. This is an advantage if leg action is fast enough to prevent stumbling during the first few strides.

It is sound physics to state that when an object is falling, its potential energy forward is proportional (1) to the height of its center of gravity from the ground, and (2) to the distance its center of gravity is forward of its base of support. That is to say, assuming equal mass, a taller pole leaning off the vertical has greater potential force than a shorter one; and, secondly, its force is proportional to its forward lean.

However, this potential aid to velocity can only be utilized through persistent drill, for the inability of the feet to move forward fast enough to a position of effective support results in stumbling. Incidentally, the faster the sprinter, the more he can use this method. With faster leg action, he can afford a slightly more forward center of gravity when "set" than a slower man, who would find this impractical.

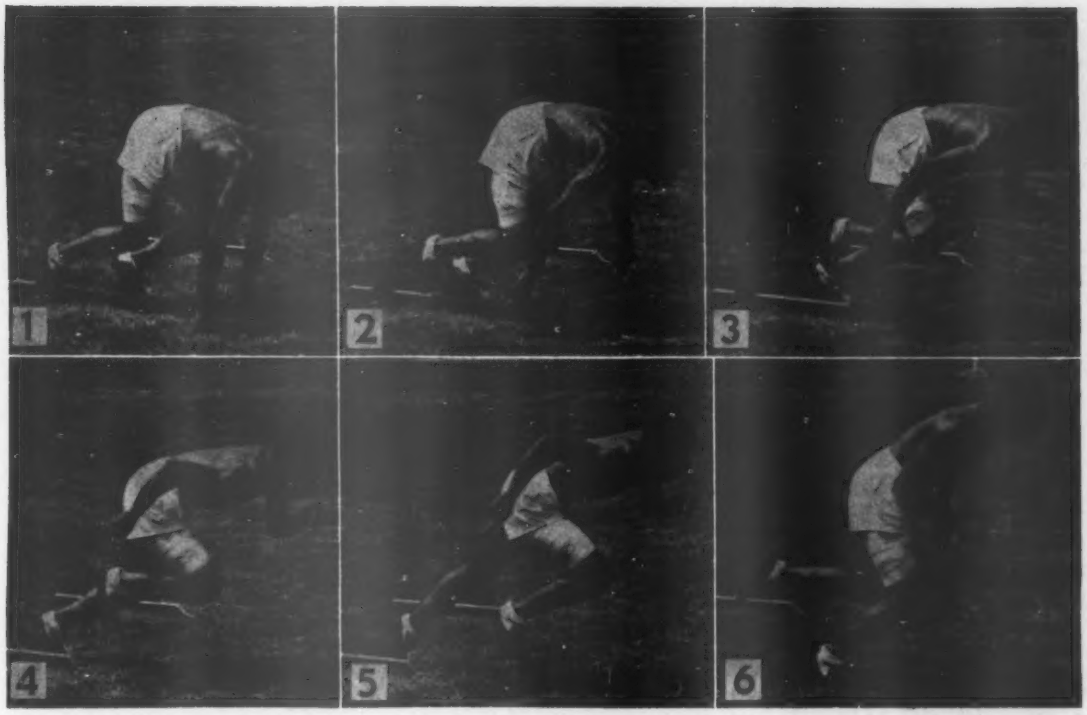
Lifting the hips has another effect, also. It raises the center of gravity above the line of force along which the legs are driving. If one were to draw an imaginary line from the back starting block to a point about 10 yards out and 3 feet above the ground, one could assume that the center of gravity should remain exactly on this line, especially during the "set" and during the first few strides.

If the hips are high above this line and not forward, the direction of force will be upward rather than out toward the finish line. The loss in power and velocity would be appreciable.

Of these two effects, the latter should have greater importance. It seems reasonable that the effect of the "falling" action is not so much in the force it directly creates as that it tends to keep the center of gravity ahead of the feet and in line with the desired direction of force.

Where should the front block be placed?

Answers to this problem vary more than to any other connected with starting. Most writers and coaches refer to types of starts. Canham[3] describes them as the bunch, the elongated, and the medium. Henry[1] write of the 11-inch spacing, the 16-inch spacing, the 21-inch spacing, and the 26-inch spacing, which he probably borrowed from Bresnahan and Tuttle[4].



ARTHUR BRAGG, Morgan State College, National AAU Champion at 100 Yards, :09.5, 1953.

Bragg has placed blocks in "bunch" start position with about 12" between blocks and about 17" between front block and starting line. Hips (and center of gravity) are high and could produce stumbling during the first few strides. However, Bragg's quick lifting of head and excellent knee action in 4-6 help balance this tendency. In fact, they appear to over-balance it, for Bragg straightens running angle very quickly and has already reached approximate angle of 45° by his first stride in last photo. (This angle should not be achieved until about 10 yards out.) This straightening effect has been aided by upward jab of forward left arm, which, in No. 4, is too close to chin, and by failure of right arm to swing backward far enough to promote forward inclination of body. Position of right foot in Nos. 2-5 is very interesting and brings up controversial point. Some coaches claim foot should come through close to ground with as little lift as possible. They argue that the higher it's lifted, the slower it will be in placement. Others take opposite point of view. They contend that by lifting foot, weight arm of upper leg lever is shortened, thus producing greater efficiency in use of power and a faster action. The traditional "ideal" action shot is indicated in No. 5. The straightened back leg always tends to produce at least the illusion of perfect form. However, and this warning applies to all single action photos - - this picture needs to be studied in light of what occurs both before and after.

But all such efforts at classification are unnecessarily arbitrary and fail to think through the factors by which the individual sprinter can reach a decision. There's no special virtue in a name, nor even in a particular number of inches, per se. Henry might just as properly have chosen 10, 15, 20, and 25 inches for his study. But there should be some basis consistent with the facts of kinesiology and physics by which an intelligent approach can be made.

Again the best work on this problem is that of Henry[1]. He assumes, very correctly, that the essential criterion for evaluating starting is the velocity gained by the body out of the blocks and during the first 5 yards. According to his work, placement of the front block should consider the length of time of application of force as being more effective than the magnitude of force or the quickness with which the block is cleared, as was assumed by Bresnahan and Tuttle[4].

"Although the rear leg develops considerably more force than the front, the latter contributes twice as much to the velocity out of the blocks because its impulse has a longer duration"[5]. On this basis, Henry found that the wider the spacing between the blocks (which implies a more forward placement of the front block, since the rear block was relatively fixed), the longer the time in which the front leg pushed against its block.

When the front block is placed 11 inches forward of the back block, as in the so-called bunch start, the average duration of time of application of force is 0.35 seconds, whereas with 26-inch spacing, the average was 0.44 seconds, a significant difference in terms of affecting body velocity. Actually, Henry found that the greater velocity achieved from the widest spacing, 26 inches, was lost within the first 10 yards.

In the writer's opinion, this loss might well have been caused by improper use of other factors - - poor balance when "set", incorrect angle of the head and eyes during "set" and of the body during the first 5 yards, failure to move the legs forward quickly and properly, etc. Further research is called for.

A close study of Henry's charts indicates that fast sprinters are able to build up maximum force by the front leg at about 0.15 seconds after the first action by the back leg. This is just before the back foot leaves its block at 0.17 seconds, a very important point to keep in mind. This phenomenon occurred without regard for block spacing.

What should be the inclination of the head and the direction of focus of the eyes during "set"?

The answer seems certain. They should be directed downward in order to implement the forward lean just advocated; yet not so far as to cause stumbling and imbalance which even persistent drill cannot overcome.

What should be the angle of inclination of the body during the start and throughout the sprint?

Human locomotion takes place, is part, by "falling" forward, by continuously moving the weight forward ahead of the points of support and of force. As long as the center of gravity is directly above the center of support, there can be no forward movement.

Further, as the speed of movement increases, the angle of inclination tends to increase. When it does not do so, the flexor and extensor muscles of the legs are unable to apply maximum force effectively. It seems logical to assume that if human muscles are fast enough to make full use of it, a forward angle of 45° would be best.

Such angle is determined by a line drawn from the back foot through the center of gravity at the moment the back foot is completing its push off the ground. At this point, 45° isn't as excessive and improbable as first thought might indicate. During the first few strides, this angle will be as low as 30° to the ground.

What is the value and action of the arms during the start?

The direct power effects of arm action in driving the body forward are equal to approximately zero[6]. Not only are the arms of relatively low weight as compared with that of the body, but the effect of the forward swing, even at the start, must always be nullified by the backward swing, no matter how the former may be emphasized in the mind of the sprinter or his coach.

The value of arm action should be stated in terms of balance, body angle, and relaxation. Balance means that they should swing so that the shoulders are not pulled out of line and so that the forward inclination of the body will be aided. Relaxation is an equally important consideration. In general, if the arms are relaxed, the entire action will be more relaxed and more efficient.

What is the meaning of relaxation in starting and sprinting?

To relax in sprinting means to concentrate nerve impulses within those muscle groups that are positively related to sprint actions, and to withhold stimulation of those muscle groups not so related. Despite the insistence of coaches in all sports upon some such definition, relaxation continues to be interpreted by the ordinary athlete as meaning a less than maximum effort.

In most situations, to relax means to "take it easy." But greatest speed in sprinting can occur only when going "all out," yet in such style as to be perfectly relaxed. See Doherty[7] on the story of Jesse Owens' greatest day. Despite all countless pictures of great champions with tight fists and taunt tendons in the face and neck, it's still certain that best performances cannot occur when effort is unrestrained and unchanneled.

To a certain extent, this is due to fatigue, even in the 100-yard dash. Several studies (A. V. Hill[8], Henry[1]) have proved that a man's maximum speed begins to lessen after only about 60 yards, primarily because of various internal and external resistances, but also because of the accumulation of fatigue effects which slow the sprinting muscles are probably not as effective in the short dashes as are the dis-coordinations of movement that come from indiscriminate "all-out" effort. Tense muscles in the arms and neck produce a high head and a more vertical running angle which make effort less effective.

Space does not permit a longer discussion. In conclusion, sprinters must practice at top speeds constantly, yet never in such fashion as to tighten unrelated muscles. To run relaxed should not mean to run slower, but rather to run easier. To run easier is, in this sense, essential to running fastest.

Where should attention be focussed during the set position?

The answer, based upon many scientific studies, is certain: Attention should be concentrated upon the forthcoming action and not upon the sound stimulus. Trow[9] summarizes such studies by stating that the average reaction time in various motor situations when attending to a sound stimulus is 0.225 second, but when attending to the forthcoming motor response, only 0.120 second, a difference of a full 0.1 second.

Other studies (Henry[5]) vary from these exact figures, but all differences favor attention upon the response. These facts illustrate the error of depending upon simple observation and opinion for one's coaching methods. The results of such experiments have been known for over a quarter century, yet coaches still vary their methods in this regard.

For example, in an article of wide influence through his world record performances, Patton[10] stated, "I've always felt that the runner should be thinking about the gun - - thinking when the gun will fire, but not moving until the report is actually heard." Either Patton did not actually focus attention as he now thinks he did (we're all guilty of this error from time to time) or he might have improved his :09.3 record for the 100.

The only real uncertainty as to the best focus of attention lies in the exact meaning of the statement, "attention should be concentrated upon the forthcoming action." Canham[3] writes, "Best results are gained by keeping the back leg relaxed and bringing it through fast and low, concentrating upon the powerful drive off the lead leg."

No studies are available on this point and Canham may be exactly correct. Yet other possibilities do exist which might be even more effective. Lacking specific data, the important point to emphasize here is that concentration of attention upon the motor response should mean a pin-pointing of attention upon a specific and simple action.

With endless drill, this concentration becomes as the psychologists write, "automatized." The well-trained sprinter often describes his mental state at the start as a "complete blank." And he's right in part; for certainly he's not thinking about anything in particular. He has no thoughts as such, for thoughts would imply a wandering and would lead away from action rather than into it.

Yet in a very real and important sense, impossible to put adequately into words, but known to every trained sprinter, he does concentrate himself, his muscles, his mind, his feelings, in terms of specific explosive action. Consciously, neither the starter nor his gun nor even its sound exist for him. Rather his mind and body are "set" in terms of movement - - a "set" from which only the sound of the gun should release him.

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SPRINTING AND SPRINT RELAYS

By: Oliver Jackson
Abilene Christian College

I want to express my appreciation for the opportunity to talk with you for a few minutes. I don't want to take too long.

In fact, I feel a little bit like the second lieutenant who, just about a week after he completed officer's candidate school, was asked to speak to a group of field grade officers.

There are so many people here so much better qualified than I am to make this talk but, since I don't see any of you up here, I will just go ahead and proceed.

We have had a lot of good fortune, I guess, at our place during the past few years in working with sprinters. In the first place, we have had some good sprinters which, as you know, is a prerequisite to sprinting or sprint relays. I think that sprinting, just like everything else, is rather contagious. If you come along and have one or two good boys in a particular event, naturally some of the other boys begin to build up a desire to want to be successful in that event and they spend a little more time on it, put forth a little more effort and usually have more success.

First, I would like to spend a big part of the time on sprint relays, because, as I said, I think it has been several years since we had someone talk about them. Coach Littlefield, a man who is as well qualified as anybody in the world to talk on sprint relays, spoke on that subject in 1956.

Sprint relays are a definite part of our program in the Southwest. I know that some of you in your areas do not run the sprint relays at all. Naturally, we should have more success than you because we run it every week and sometimes twice a week if we have two meets during the week.

The weather in the Southwest, as in California, is definitely condicive to sprinting and we have it as a part of our regular dual and conference meet programs, as I said.

We have it in the first event on the program, and for those of you who don't know exactly how we run it, we open our meet with a 440 yard relay, then run into a regular schedule; one mile run, quarter, regular NCAA schedule, and, of course, wind up with the one mile relay.

We like it. It has become a glamour event in the Southwest. Our people are quite sprint conscious and they like to see sprinters run. You put the four best sprinters each team has and compete them against each other in a sprint relay and it tends to get the meet off on the right foot as far as we are concerned.

I don't think it tires any of you sprinters. In fact, I have found that almost without exception our sprinters perform better in the 100 yard dash or the 220 after they run the 440 yard relay than they do if they do not precede that sprint with the relay.

I think that it warms them up. It gets the muscles ready to accelerate, it prepares the muscles and prevents them from being injured, I believe. As you may well know, many sprinters fail to warm up properly; although I know that a lot of controversy exists relative to warmup. At the same time, we think it helps to get our meets off with a lot of success as far as the spectators are concerned.

We use the more or less standard method of running the sprint relay, as far as baton changes and things like that are concerned, but we have a few things certainly not original with us, on which we have spent a lot of time. First, though, let me say that somebody asked me yesterday how we go about deciding what boys will run in what positions.

I say that as far as we are concerned, we think that the key men in the 440 yards or 400 meter sprint relay are the number two and number three men. They have to be the best men as far as judgement of distance, speed, things of that type are concerned. They have to have those senses because they have to do more with the baton than the other two boys.

All the man who runs first has to do is to start with the gun and hand the baton off. The man who runs anchor just takes the baton and heads for the tape.

The men who run the number two and number three spot are very important because they have to take the baton and hand the baton off. As a result, we have spent many hours with these men, the middle men, as well as the others, of course, but especially the middle men, working, helping those boys to master both taking the baton and handing the baton.

We try to work the sprint relay, at least practice on it, every day the weather is decent. We practice it on the grass at half speed, first quarter speed, half speed, two-thirds speed, seldom at top speed. Actually, when we get into the season we run top speed one day a week.

We work on the baton pass nearly every day, as a result I think our sprinters probably get more work than most sprinters. They do repeat 75's for a per-

iod of 20 to 30 minutes and you can do a lot of them. True, they are not running 75's at top speed, but maybe at half or two-thirds speed, but if you run them for 20 or 30 minutes, which we do several times a week sometimes, you get lots of repetitious running and lost of conditioning. Actually, we could get them in pretty good shape without any more repetition other than what they get in handling the baton.

Our boys like to do it. They take a lot of pride in handling the baton although, as you may have noticed, they make a lot of mistakes.

I was quite amused at several things in the article that appeared in "Sports Illustrated." I'll tell you one thing; they came down to one point of what not to do when handing the baton when they watched our team and took that picture. I didn't know a thing about it until after it was over.

This year we had a group of youngsters on our team. Three new boys and one veteran. Some of you may know that in 1958 we had three seniors and a junior, and if there have ever been any pros in handling the baton, I think they were professionals. They had done it for a long time and worked together. They never worried about handing the baton, they were always going to get a good exchange and sometimes a great exchange, but never a bad one.

When they graduated last year, they broke the world's record, the 440 relays. We came up with two sophomores and a junior who didn't run in it last year and one senior, Woodhouse, and they did everything that you can possibly do with a baton this year except throw it up in the grandstand! They kicked it over the grandstand in the Texas Relays!

Now, relative to personnel. Possibly you noticed that we ran Woodhouse second because he was our second sprinter last year. We didn't do it because he was the best baton man for, as I said a while ago, we like the best baton man in number two or three spot. We ran him there because he was a fair baton man and mainly because he was a terrific sprinter. And you noticed that Clyde Littlefield ran a young man by the name of Southern there also. I'm sure that he had the same thought in mind that I did in that the number two man should be, if possible, your number two sprinter because he can put lots of pressure on your opponents if he throws in a terrific leg. The pressure gets so great, especially on inexperienced opponents, that they are liable to fall down on the takeoff, throw the baton up in the grandstand, take off too soon or away too late. That happened to many of our opponents last year because Woodhouse was running number two. It happened to us this year because Southern of Texas was running in the number two spot.

Normally we like to use a good starter on the first leg. That may be impractical to do because this year with the new boys we used a quarter miler who

is actually a poor starter on the number one spot. We used him because he was one of our top four boys but he was a poor baton man. If we had used him on the third leg or the second leg of the relay and if he did a poor job in either position of taking the baton, he would have ruined us.

In the number three spot we try to use the boy who is the best baton man.

In the number four spot, of course, we like to use our best competitor, the boy who can always get that extra bit of force he needs, that extra drive and will to win the race for you and who can come from behind.

We work on the baton exchange, both on the straight away and on the curve. We spend more time on the straight away, of course, than we do on the curve, because you are taking more of a chance of injury when you are running the boys at very near top speed in handing the baton off on a curve. As you know, curve running is a little more difficult. The muscles work a little bit differently and there is a greater chance for muscle pull.

We have been very fortunate in having had very few injuries as a result of handing the baton, but we have had some. I notice that some of you in the room this morning have had several muscle injuries to some of your boys and I think that in most cases those injuries come from trying to extend themselves too much in trying to reach the outgoing runner.

We have a rule at our place. We tell the boys to never reach, never over-extend themselves, to hand the baton off in practice. We just don't allow it. We say it so much that finally our boys holler at each other if they happen to see one of our freshmen extending himself. They tell him not to extend himself because they know that is one of the places that he can receive of lot of injuries. Now, of course, you can't tell the boy not to extend himself in the heat of a race if the outgoing runner takes off a little bit too soon then he has to extend himself to make the exchange.

We work on the exchange on the straight away (on the grass more than anyplace else) and when we get on the straight away we work on it at half or two-thirds speed one day a week and at full speed if the runners are in pretty good shape.

Also, as you well know, if you are running on a track that starts the quarters or sprint relays close to the curve the boys would be in a different position than they would be if you started in the middle of the track. Therefore, you have to work at different positions in order to get the boys used to taking the baton at various spots on the track. This will determine, to some extent, their speed of baton exchange.

We use something that isn't particularly original with us. I know some of you have seen it before and it is a very simple thing. I know that Jack Patterson and some of those from our section think I am peculiar in setting up something that is so elementary. Our kids like it and they have found success with it and therefore we continue to use it. That is our method of determining when the baton should be exchanged. Where the outgoing runner should take off and so forth. We do it this way, and I will try to draw it on the board and give you an idea of what it is.

This is your 20 yard zone; exchange zone. We stand our runner on the inside, letting him know that he is going to take up only one-third of the lane. We want him to know that he only has one-third of that lane and the incoming runner then has two-thirds of the lane. We want his feet pointing in the direction he is going to run and not crosswise or at a 90° angle. He is moving down the track like this on his feet, practically straight down the track. There is a little turn to the back foot. Of course, we like to have his feet fairly well spread because if the front foot is too close he will get off balance and tend to stumble. So we like them spread wide enough to get what we call a full lean. We have actually three marks. You may think this is possibly too many marks, and too many for a boy to think about, but actually, after he works with it for a while it becomes second nature to him.

We have a mark back outside the zone anywhere from 20 to 23 feet, depending on the individual, which they must work out for themselves. Back from that spot we have another mark that is 15 feet giving approximately an overall distance of 23 and 15, 38 feet you see, when movement is begun on the part of the outgoing runner.

When the incoming runner hits that 38-foot spot the outgoing runner begins what we call his normal lean. We are trying to get that individual to simulate a starting position. He is looking back over his shoulders. His hands are down on his knees so that his right shoulder will be low and he is looking back with his feet pointing ahead. Therefore, he is practically in the same position as he would be on the starting block.

When the runner passes this area and gets to the 23-foot spot; that is the takeoff spot. It is not hard to master and the kids can pick it up in a short time.

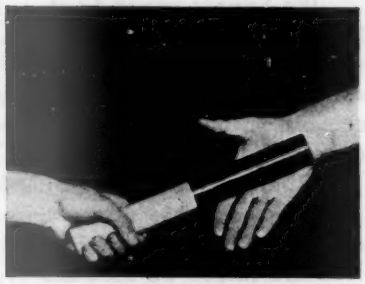
Some people say you can reach top speed at 15 yards, some at 20, some at 25. Again, that depends on the individual.

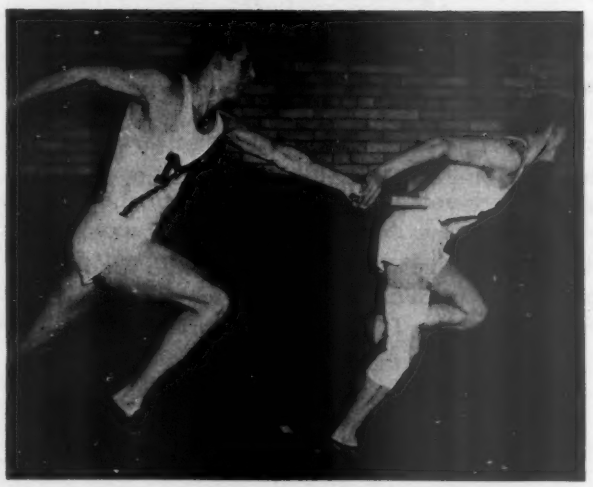
We are trying to get one thing done - - to get the baton exchange made when both the runners are going at top speed. In order to do that we know that the exchange must be made somewhere between the 16 and 19 yard mark, pre-

VISUAL PASS for distance relays, where incoming man's only responsibility is raising baton to eye-level position where it may be *taken* from his hand.

PHOTOGRAPHS AND COMMENTARY BY DON CANHAM

VISUAL PASS VARIATION employed a great deal with mile relays, where baton is handed off on a horizontal rather than vertical plane, *below* eyes.





BLIND PASS for sprint relays, where incoming runner is charged with placing baton in relief man's backwardly extended hand. Latter doesn't look back.

ferably the 19 yard mark. At about 13 yards through the zone we put an "X" on the track. That reminds the boys to drop their receiving hand.

Our boys used that this year and the boys in the past have always used it, and after they have run together for a year or maybe two years it becomes more or less automatic and they don't put that "X" on the track. New boys put it on there and it reminds them that the hand must be down. The receiving arm will be back in the normal stroke with the thumb toward the hips, the four fingers together and the hand opened up wide in order to get a good target for the incoming runner to place the baton. He needs a good target. When that hand comes back to the back position where he is going to stop it, it must stay there. It must not move. That is one mistake that the majority of runners make. When they come back and they feel that the baton should be there and it isn't, they start reaching for it.

In Melbourne in 1956 I made a statement at a dinner we had down there for sports writers and so forth. They talked about the times, and the next day and three or four times during the games one of them asked me what I thought they could run the relay in. I didn't know but I thought they ought to run it in :38 something. Of course they laughed at me, but with Ira Murtson running first, Leeman King running second, Thane Baker running third and Bobby Morrow running fourth, if the boys had enough time to work to get their exchanges down as well as some of the kids that work together on a college team, I knew they would run :38.7 or :38.8. I can show it to you in figures. I think that next year, and in years to come, you are going to see the sprint relays go down to :39.5, :39.3, and so forth. I thought that our kids in 1958 were capable of running :39.4 or :39.5 at Modesto. The reason for that was because they handled the baton well. You can't handle the baton twice as year as the Olympic teams does (maybe a week or so) and be able to run the times that you would like to run even though the boys are the greatest sprinters in the world.

Those are the marks that we use in the exchange. We try to make it, as I say, between the 16 and 19 yard mark without missing a stroke of the arms if possible, and try to keep the back arm in the same position or same angle as it would be if you are running the same sprint race down the track.

We take our 880 relay and try to actually split the touch-off distance. If he is giving this boy 23 feet on the 440 relay we usually divide that by two which means 11 1/2 and work up from that, extend it a little bit more and give him 12 1/2, 13 1/2 and, in some cases, up to as much as 15, according to the speed of the incoming runner. Some finish the 220 course faster. If so, this distance in here is from 20 to 23 feet in the 440 relay and from 11 to 15 feet in the 880 realy and, as I said, we have had fair success with the exchanges of the baton in the 880 relay.

Question: Are you consistent with the outside pass all of the time? The turns make no difference to you?

Mr. Jackson: Yes. Some people use the inside pass and, of course, do a wonderful job with it. I think it is what you like particularly. What you are sold on; what you can sell your boys on. In our case we always take the outside pass. In other words, we always take it in the right hand and exchange it to the left hand, except in the case of the anchor man who takes it in his right and keeps it in the right hand and just keeps on moving. Our number two and number three men take the baton in their right hands, bring it across and exchange it to the left hand and they try to do it without missing a stroke of the arm.

Question: Exchange immediately?

Mr. Jackson: Immediately. As soon as it is taken you come right across because you are going slower then than at any other point in the race and we feel that the exchange should be made at that point.

Mr. Larry Snyder: Ollie, do you ever have your man, even though he is going to receive it with his right hand on the curve, do you ever have him look over his left shoulder?

Mr. Jackson: No, but some people do that. I think it is a very good point. Most of our kids are right handed and to look over the left side is not normal.

Question: In the 880 relays does your man look back at any time?

Mr. Jackson: No, he doesn't

Question: Does your lean zone remain the same in the 880's?

Mr. Jackson: Yes, the lean zone remains exactly the same in the 880 as it does in the 440 except that we cut down the takeoff.

Question: Where do you make your exchange in the 880 relay? The same as in the 440?

Mr. Jackson: We try to make it the same although again I would say we are more conservative. I would imagine that we would try to make it around the 16 yard mark rather than the 18 or 19.

Question: Do you have any hints on the incoming runner on the exchange. What do you tell him about shifting that baton?

Mr. Jackson: The incoming runner comes with an upward stroke. He must look at the right hip, the outside hip of the outgoing runner, because that is where the hand is going to stop, just about hip high. Glue his eyes on that spot and never take them off, because if he ever takes his eyes off the spot, chances are he is going to miss that hand. If you will notice that when the boy does miss that hand when he comes in, inside or outside of it, I would say that in every case he has taken his eyes off that target, that hand.

Mr. Ross: Where do you place the responsibility of getting the exchange? Which man?

Mr. Jackson: The incoming runner has sole responsibility for putting the baton in there. All the outgoing runner is to do is to be sure that he puts the hand back at the proper time.

Question: All this depends on sight. Is there no command from the incoming runner?

Mr. Jackson: No, we don't use the command. We find that most of the high school boys who come to us use the command and occasionally our freshmen use it but we don't like to have them use the command because they get to depend on it too much.

Question: Do you have any verbal contact at all in the 880? What do you suggest if the runner leaves early?

Mr. Jackson: Oh, yes. Yes. He gives the command and the command is "Whoa!", gee and haw, you know, when you want him to slow down, put on the brakes. You certainly don't win many races if he goes out of that zone. We try to get him to slow down and he can say "whoa" easier than anything else. "Whoa" means "stop" in Texas. I don't know what it means in Michigan!

Question: Do you have anything verbal in mile relays?

Mr. Jackson: No.

Question: Who is the pressure on in the mile relay? Still on the incoming runner?

Mr. Jackson: No. In the mile relay I think the pressure is on the outgoing boy. If your quarter milers are like mine, they don't need any more pressure. They have enough pressure on them trying to win. You take our quarters; we put the pressure on the outgoing runner, or the responsibility for handing the baton. All this boy has to do is to place it up in position and we would rather have it too high than too low.

Question: When Oliver gets the baton what is his first action? Does he bring the arm over or bring it around?

Mr. Jackson: We try to come right straight through, because we feel it is a shorter distance right straight through here and faster action and right straight to that arm and as close to the body as you possibly can.

Question: When you are coaching your speed work do you have your team; first, second and third man running full speed? I understood you to say earlier that you only had them run full speed once a week.

Mr. Jackson: Yes.

Question: How do you get that good fine coordination just running full speed once a week?

Mr. Jackson: I was speaking of after we get into the season. Before the season begins we are running at pretty near top speed two or three times a week with one or two exchanges. But, as I said, we work at top speed after the season begins once a week and that is usually either on Tuesday or Wednesday, normally Wednesday.

Question: That is for the full team?

Mr. Jackson: That is for the full team. I don't mean we went through the full 440 relay. We went through the 440 relay in practice one time last year. One time, I believe, our boys ran faster than we have ever had a team run in practice and I am sure it is because we never run the thing in practice. I think we ran about :42 flat, :41.8 or .9. That is because I am sure we just haven't run it in practice. If we let the boys run at top speed when they take the baton they slow down for about 50 or 60 yards and then build up and blow in that last 25, 35 to 40 yards.

Question: Do you have any competitive baton exchanges? That is, do you put two teams on the track and put any pressure on them?

Mr. Jackson: Yes. When running full speed we go down to the curve and take maybe three groups of boys handling batons, three lanes of them coming in.

Question: Oliver, my weight men, and runners as well, would object like hell to being a part of those three teams.

Mr. Jackson: Yes, well, we run it. It only takes six runners, you know. We run our quarter milers for work on it as much as our sprinters.

THE 440 RECORD HOLDER

By: Carl B. Antel
Lakewood, Ohio, High School

A track coach does not meet many boys who have both the natural ability and the burning desire to become champions. Dave Mills, the national scholastic 440-yard record holder, was one of these unusual boys. He was born in Galt, Ontario and later moved to Sudbury where he spent most of his childhood. In 1953 he moved to Cleveland, Ohio and attended John Marshall for two years. During the summer of 1955 Dave moved to Lakewood and participated in our Junior Olympic program that summer. We saw that he had the natural ability and the desire to excel in track. With this combination we knew Dave was destined for great things.

In the fall of 1955, he came out for cross-country and spent most of his time doing steady running. Dave did jogging over distances of a half mile to a mile and a half, but did not do any competitive running. We are sure competitive running would have done him a great deal of good, but at the time he was not forced to compete.

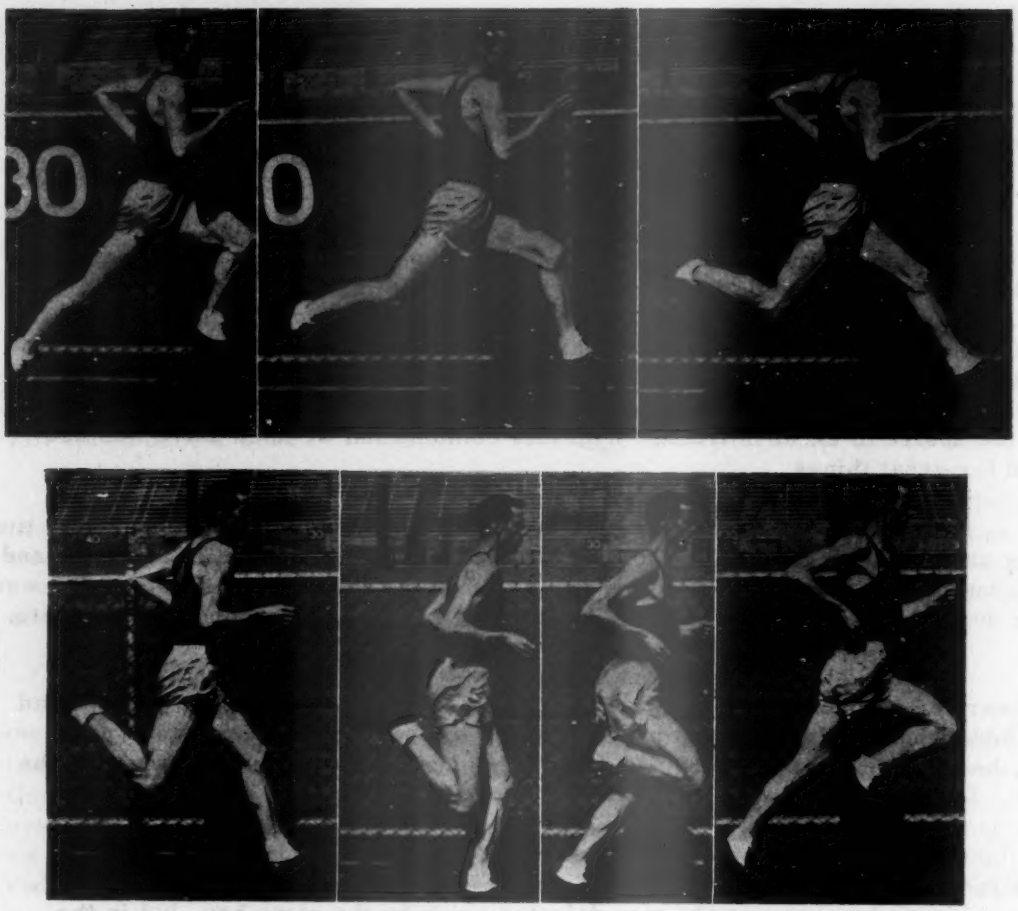
When we started indoor track, Dave was worked into the relay teams. Ordinarily he would have been worked into the open events, but that year we had two boys who could defeat him in the short races. As the indoor season progressed, he was moved in with the 440-yard men, and in a short time was one of the best. Dave went on to win every 440 race the balance of the indoor season.

As the outdoor season progressed, Dave kept on improving. His best time in the 100-yard dash was 10 flat, in the 220 -:22.3, and in the 440 -:49.9. During his sophomore year he was defeated twice by the same boy, but in the state finals Dave came through as state champion.

When Dave started his second year of track, many people were expecting great things. He started off strong during the indoor season. In his first big relay meet, he ran a 49-second anchor in the mile relay. This relay was run on a 12-lap track.

Outdoors Dave was also doing well with a :9.85 100, :21.8 -220, and a :49.6 440. Three weeks before the state meet he developed a tender leg and was not worked very hard in practice. Winding up the season with his leg well taped, Dave finished second in the 100 and 220, and again won the 440 in the state meet.

In his senior year, he again went out for cross-country and worked hard at it. He was sold on the two-mile distance but did turn in some average times.



This training helped him reach his goal.

Dave was eighteen years old when he started his senior year in track, and was able to take more work than some of the other boys on the team. His early indoor work was set to build up endurance in order to get him into top shape for the outdoor season. Our plan was to use him in the 880 during the indoor season and then drop him back to the 440 outdoors.

We start practice after Christmas vacation and have a three- to four-week preliminary training program. During this time the work was gradually built up until we felt Dave was ready for the racing distance. We have a 20-lap track, but treat it as a 22-lap track. Following is a breakdown of Dave's first month's work:

First Two Weeks - 1. Warm up by jogging clockwise five laps, 400 yards. Ten minutes are devoted to exercise which consists of stretching, chins, push-ups, leg lifts, and rope skipping. 2. Pick-ups - these were done in groups of five boys. Each time a lap was finished the last man moved up to take the lead. The number of laps was increased as the training program wne along. We start with five laps and repeat twice. The number of the repetitions also increases as the training program progresses.

Second Two Weeks - 1. Same as warm-up as used previously. 2. Repeat the 400-yard laps. We used five laps for the repeat work. The boys started with three laps and had a two-minute rest after each lap. They worked up to four laps with a three-minute rest after each lap. Each lap was run in exactly 12 seconds. 3. After ten minutes rest, they jogged through an 880, using proper arm carry and keeping stride in mind.

The last week in February misfortune seemed to take hold of our champion. One morning Dave stepped off a curb and received a bad sprain which kept him off his feet for almost two weeks. He could only do jogging for another two

weeks, but when the city indoor meet rolled around Dave was in good enough shape to run away from everyone in the field.

A 48-second 440 was set as his goal for the year. The first outdoor workouts were over the short distances.

Monday - 1. Up the ladder - 25 yards, 50 yards, 75 yards, 100 yards, and 150 yards. The only rest granted was the walk back to the start. 2. Sprinting the curves and walking the straightaways. The idea of running as close to the lines as possible was stressed. 3. Pacing through a 660.

Tuesday - 1. Three 330's at 39 seconds. Walk a lap each. 2. Starts going 50 yards on each. 3. Pace through an 880.

Wednesday - Repeat Monday's workout.

Thursday - Repeat Tuesday's workout.

Friday - Ten 120-yard pick-ups on the grass.

The first meet of the outdoor season was held in the rain and on a heavy track at Bethany, West Virginia. Dave ran a :48.5 that day and amazed everyone. Any sprinter who could set that time under the existing weather conditions had an excellent potential on a good track. When the season was underway, there were two meets a week for several weeks. Tuesday and Saturday were our meet days. This schedule did not allow time for much work between meets. A great deal of Dave's training for the balance of the season was in the 330's and 660's.

The 330's were gradually lowered to a point where he was really going all-out to hit 36 seconds. This work was done on Wednesday and Thursday, so Dave was only getting one full day of rest before a big meet. After the second week in May, we stopped all force work during the week and worked on starts and pick-ups on the grass. After his final week of 330 work, Dave responded with :47.8 at the Miami (Ohio) Relays. The last two weeks of the season he had a :46.8 440 in the district meet, and in his final meet, the state meet, he won the 100 in :09.7, the 440 in :46.6, and the 220 in :21.2 seconds.

Looking over his times in the three races for three years, Dave's best times were as follows: Tenth Grade - 10.0, 22.3, and 49.9. Eleventh Grade - 9.85, 21.8, and 49.6. Twelfth Grade - 9.7, 21.2, and 46.6.

With the exception of one time trial, Mills never ran a 440 during practice. Most of his work was done in the 330 and 660. The time was always given at each 110 yard mark so correct pace could be practiced. Mills had the ability to judge his pace well and could always hit the 220 mark in the time asked. When

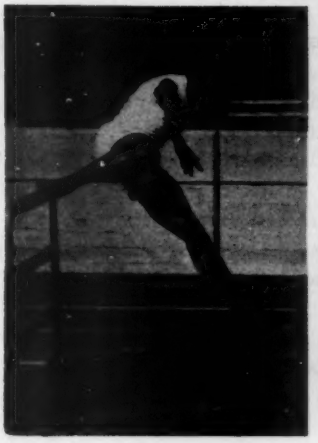
he set the national 440 record, we told him to hit the first 220 in 22 seconds. His time was 22 flat.

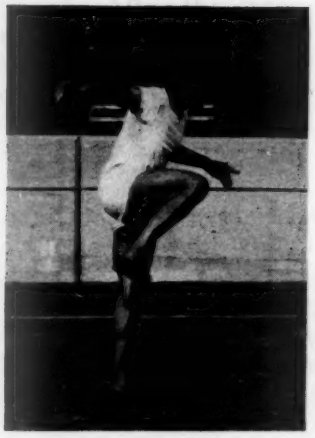
Being a sprint-type quarter-miler he was able to get a fast start and stay out of trouble. In many races, after coming out of the chute, Dave would select the best lane for the balance of the way to the curve.

There are always some factors which help a boy achieve success. During his high school career Dave never drove a car or took the bus to school. He lived a mile and a half from school and walked both ways. During the summer he spent many hours on his racing bike, riding wherever he had to go. Wheat germ was added to his diet and he used it daily. He also took soda mint pills after a race to settle his stomach.

Dave never ran the 880 in competition, but he is made for that distance. He ran a time trial in that distance one day and came in with a 2:01 without forcing himself. With proper work for the 880, we are sure he could have been in the 1:55 group.

Dave had the mental attitude necessary to become a great track man. He was one of the finest boys with whom we ever worked. He put out 100 per cent and was always willing to help the younger runners. His opponents always looked up to him, not only for his running ability, but for his fine sportsmanship and his ability to maintain modesty. His goal is to run with the 1960 United States Olympic team. Dave will become a U. S. citizen before the next Olympics. A coach could not ask his own son to be a finer person. In his final performance in the 440, Dave gave all who worked with him a thrill they will never forget.





HURDLING - HIGH AND LOW

By: Lloyd T. Duff
University of Connecticut

Beginning coaches with scanty knowledge of hurdling techniques should clearly understand that "hurdling" embraces two distinct events - - the high hurdles and the low hurdles. Each possesses a distinctive style and technique requiring a different teaching approach.

HIGH HURDLING

Before delving into techniques, I'd like to discuss a certain point which has helped clarify my thinking on the event. Given the opportunity to choose between two boys of equal speed, coordination, and desire, all of us would pick the taller of the two as the lad "most likely to succeed."

This makes sense, of course, but not simply because of the advantage engendered by height. The factor which would make the taller boy the better hurdler is that he is split higher.

A boy whose crotch is, say, 36 inches from the ground would have to rise only three inches to clear a hurdle. From a simple physics standpoint, the trajectory of an object which has to rise three inches would bring it to the ground sooner than another object of equal velocity which has to clear five inches. We all know that a runner cannot gain or maintain speed in the air. Therefore, the higher the split, the lower the trajectory and the faster the hurdler will get back on the ground.

My theory, then, is this: Tall or short, the hurdler must do everything he can to keep his crotch high while hurdling. A short hurdler can never attain a 7-4 or 11 ft. clearance (take-off to landing) of the hurdle when traveling at the same speed as the tall hurdler.

With Dillard's speed and low crotch he had to clear 13 ft. over the hurdle. The short hurdler should not strive to make an 11 ft. clearance, but simply get to the ground as soon as possible. The higher his crotch is at the take-off the sooner he will get back to the ground.

Now you have my theory. The problem lies in applying it. Assuming that none of us is blessed with a boy who has a 39-inch split, we can apply the following to all our hurdlers.

The most obvious method to develop a higher crotch, aside from leg pulling exercises, is to take off on the toe. Immediately the crotch rises three inches.

Running on or taking off from the heels keeps the crotch low. So make sure your hurdlers take off from as high on their toes as possible.

The first hurdle is the big one for most athletes. The tendency is to continue to rise instead of getting back to the ground quickly. The reason for this goes back to the theory that the hurdler is still coming up from the start - his crotch is still rising.

Work with your boys to get them up to full running height by the fifth step, so that they can feel they're above the hurdle and coming down on it, rather than still coming up at the take-off. This, of course, applies equally to every hurdle, but the problem isn't as great after the first hurdle.

If I were to choose one word as the most important from all of the wonderful hurdle coaching I received from Larry Snyder it would be this: DIVE.

A hurdler doesn't jump, spring, or leap at a hurdle if he wants to stay low. He DIVES. The head and shoulders lead, aiming for a spot on the ground about five feet on the far side of the hurdle. (On the first few attempts, they may actually hit that spot!) And, remember: To dive for that spot, the hurdler must feel that he's above the hurdle on the take-off.

It's well nigh impossible to dive and kick at the same time. Diving implies a powerful, driving motion FORWARD. Kicking is an upward motion, and if the lead leg is kicked or thrust at the hurdle it will tend to rise above it.

The lead leg, then, must not be kicked or swung up. The motion is with the knee, driving upward to the chest, which is driving down. Collision? Fine! If your hurdler hits his chest with his knee on every hurdle, he will be in the best possible position.

The lead leg action is similar to a bicycle motion with the knee bent. Once the knee has hit the chest, it drives straight toward the ground on the other side of the hurdle. Result: The foot is back on the ground with the leg in the proper position, not ahead of the hurdler where he must rise up over it, but under him where he can ride on over it.

Don't overlook this last point. If the leg hits in front of the body, there will be a slight hesitation while the body moves over to a point where that leg can drive it forward.

Therefore, work on this lead leg motion. Your hurdler can dive at an imaginary hurdle, bringing the knee to his chest and snapping it back down to the ground. The lower leg remains relaxed during the lift. The knee is not locked.

Let me stress three more points. Another way to get the crotch higher is through the dive mentioned previously. If the upper body dives and approaches a horizontal position over the hurdle, the hips are no longer the pivot. The center of gravity moves forward and the hips rise as the head and shoulders go down.

This "tuck" position on top of the hurdle keeps the body from rising over the hurdle and will allow the front leg to be snapped down with more force.

The motion of the arm opposing the lead leg is of extreme importance in a good tuck position and in keeping the body on balance over the hurdle. As the lead knee is driven up, the opposite arm should be brought straight forward, reached out and DOWN directly in front of the shoulder.

No attempt should be made to touch the toe. The hand should reach out as far as possible and sweep down past the foot. This keeps the shoulders level and helps pull the upper body into the dive.

The recovery is made with the elbow at shoulder height, and should come straight back just high enough to clear the trailing knee. Do not allow the lower arm to swing back outside the elbow, as this will pull the shoulder back with it and put the hurdler in an off-balance position in the landing.

The trailing leg is pulled through, not jerked. Its path should be just high enough to clear the hurdle and then on through to the front. Bringing the knee of the trailing leg up to the chest is simply lost motion.

The trailing leg can be the cause of an uneven gait between hurdles where the hurdler lets it drop to the ground instead of pulling it on through to the front. If you find a step pattern which shows a short middle stride or where the steps are out of line, get your boy to pull his back knee through and reach out a little more.

LOW HURDLING

In speaking of the high hurdles, I attempted to show that the hurdler with the high crotch has an advantage over any other hurdler of equal speed and coordination who's split lower - - due to the fact that the boy with the higher crotch doesn't have to spend as much time in the air over each hurdle.

When we turn to the low hurdles, we find that crotch-split is no longer of any importance. All hurdlers can straddle a low hurdle, indicating that when running over these barriers, the crotch need not be any higher than it is during any race.

No matter what form your sprinter uses or how unorthodox he may be, his style of running is (or should be) the most effective for him. Now if you agree with this, then you must also agree that anything which detracts from that form would slow him down.

Leaving the ground for a longer length of time than is absolutely necessary, bending forward too far, or reaching out to the opposite toe would detract from sprinting speed. As there is no necessity for any of these things in order to clear a low hurdle, the low hurdler shouldn't try to imitate high hurdle form.

The low hurdle race is a sprinter's contest. Many sprinters who could never become high hurdlers are champions in the lows. By the same token, many good high hurdlers don't show up well in the lows because they lack the sprinter's speed.

Of course, in a race between two sprinters of equal ability, the one best able to get over the hurdle would come out on top. Sometimes a hurdler will beat a sprinter in the lows for the same reason. So, though the lows require less form than the highs, there still is a way of getting over them faster than the other fellow.

While I don't believe I can lay down a set pattern for going over the lows, I'd like to point out a few principles which may prove helpful.

The normal number of strides to the first hurdle is 10. As speed is lost through taking more steps than are necessary, it's better to change a boy's start than to allow him to take 11 steps. (You may get an occasional tall boy who's fast enough to take nine strides without slowing down his start too greatly.)

When a boy has trouble getting to the first hurdle in 10 steps, work with his start and in particular with his first stride. Get him to reach out on his first step. It is usually possible to get that first step between 24" and 30" from the starting line, though this is probably more than a sprinter would generally use. A high knee lift with good lean should enable even a short boy to reach the first hurdle in 10 strides.

The actual distance between the take-off and the first hurdle is unimportant except as it affects the speed over the hurdle. Taking off too far back causes stretching and means too much time in the air, while the opposite extreme causes jumping in order to clear. The point of take-off won't cause any problems

unless the boy is stretching to get to the hurdle or is over-running it.

Both of these errors are corrected by working on stride between hurdles rather than adjusting the take-off. One hint which will help in the case of stretching to reach each hurdle is to pull the trailing leg through and reach out with the knee. I will go into this more thoroughly in a moment.

In his approach to the hurdle, the athlete should attempt to increase his body lean a little. On the actual take-off the body should lean only enough to compensate for the increased knee lift of the lead leg to clear the hurdle. A "tuck" position or diving in unnecessary to clear the low hurdle, as the crotch doesn't have to rise in order to clear the hurdle.

The lead knee is lifted with the lower leg relaxed just as in sprinting. The knee should lift just enough for the foot to clear the hurdle and the leg should not be straightened.

Many times the hurdler will throw the leading foot at the top of the hurdle. This puts the leg in an awkward or unnatural position for running.

Bent Leg is Vital

Though few hurdlers on either highs or lows can keep a bent leg on top of the hurdle, I believe they should constantly strive for it, as this will prevent them from throwing the foot and also keep them thinking of driving the foot down with the knee for the landing.

It's still important in the lows to get back quickly to the ground. If the knee is driven down just as the foot clears, the landing will be made with the foot under or behind the body. To reiterate: This means that the body can glide over this leg rather than having to rise to get over it.

The trailing knee need only go high enough to clear the hurdle. Bringing the back leg up parallel to the ground is only a waste of time. The knee should pull through over the hurdle and come out to the front of the body before being allowed to drop.

Failure to do this will result in a short first step after landing, a break in the rhythm, and sometimes cause the hurdler to be progressively farther from each hurdle on the take-off.

The knee should not be brought up to the chest, but simply pulled through and reached out for a normal stride.

The arm action should be as close to sprinting arm action as possible. The arm opposite the lead leg must be reached out and down as in the high hurdles but only enough to keep balance.

The arms cannot continue in normal sprinting action because it takes longer to get over a hurdle than it does to take a normal stride. If the arms continue in normal action, they would be possibly a half step ahead of the legs.

Reaching out helps keep the shoulders straight, while reaching down helps maintain a forward body lean. The arm action, then, is similar to that of the highs, except that it isn't as exaggerated. The backward motion of the opposite arm in landing is with the elbow, and the lower arm should not sweep out to the side.

As in any race, form alone won't win. The winner must have speed and a real determination to be a champion. He must be willing to give everything he has between each hurdle from start to finish - - excluding the time when he may pruposely go into a speed coast to conserve energy.

I maintain this, however, In every athletic skill, there's a most efficient way of performing; and when two men of equal ability and determination meet, the one who's most efficient will win.

Efficiency is form! Some men can win without it, but I cannot help but believe that they'd be even better if they had it.

Some men will never acquire form. They are simply not coordinated enough to perform the required skill. But we certainly won't exclude them from our teams if they can still win points.

An athlete is reported to have answered suggestions that he improve his form by saying, "Youse guys get the form - - I'll get the medals!" Perhaps so, but unless you have a boy with the speed of Owens, the coordination of Mathias, and the strength of Nagurski, make him "get the form," too!

WORKING WITH THE BEGINNING HURDLER

By Don Seaton
University of Kentucky

I am going to speak on the selection and training of beginning hurdlers. The first item is one I can gloss over because most of you realize, as I do, that the selection of a hurdler is a long, drawn-out practice, and most of you use different types of selection.

The usual method in the high school is to ask in an assembly for the boys to come out for track. There are hundreds of different ways of encouraging a boy to come out for track. I don't believe I need go into that at all.

The method of taking each member of the squad and asking him to go through different events at different times is the tried and true method of selecting most of your different event men in high school. Oftentimes we have to do that in college, too.

I believe I would warn beginners in this field that they cannot say, "If you want to hurdle you must be a tall, muscular, fine-looking young man." They are not the only ones who can be hurdlers. They come in all shapes and sizes. Of course, you will soon find out that about nine-tenths of the hurdlers who come to you are going to be short, or of medium height. You are not always going to be blessed with nice, long-legged, fine hurdler types. Those of you who were on the field yesterday realized this when you looked at Hayes Jones. You know that he is a fine hurdler, and certainly he is not long-legged.

The trouble with most of us now is that we convert our sprinters, or would-be sprinters, to hurdlers and, of course, they often don't have the flexibility to be great hurdlers. I usually look for a broken-down dash man or a high jumper (a boy who can't high jump very well) and try to convert him into a hurdler. When I find one who is flexible, I feel that I have a prospect.

Many years ago, I coached up here at Senn High School in Chicago. When starting a beginning hurdler, I soon realized that an important fundamental of hurdling is control of the arms. I found that by controlling the arms, I could get the boys started with proper aerial balance-- a key to good hurdling.

The first thing I do with a beginning hurdler is probably the same thing you do. I ask him to sit down on the grass and assume a hurdling position. Nine times out of ten he is stiff and he cannot get into the full position, but you can usually tell whether he has possibilities. I usually say, "After you do this a while in the morning and at night at home, and do the exercise out on the field, it won't be long before you can get into this hurdling position over a barrier."

The next step is to set up a low hurdle on the grass and ask him to assume that position in going over the hurdle. Of course, that sometimes takes a little nerve on the part of the boy. Some coaches like to use a bamboo crossbar or rubber-top hurdle, or things of that nature. I have not found it necessary. I believe that most boys have enough courage to go ahead. If they don't have that much courage, I don't believe that they are ever going to be very good hurdlers. After the boy hurdles a few times (what he thinks is hurdling), then I show him how his arms have moved out of position, as they always do with the novice.

I say, "You cannot hurdle until you use your arms to hurdle and to run with." We use the double arm action to stop flying arms and help with body lean. We go so far as to lock thumbs in the beginning. The difficult part is to have him hang onto the thumbs so that the arms don't fly all over the lot. We stay with that a long time. As a matter of fact, I go to my advance hurdling in the fall and we lock our thumbs and in the regular hurdling position go over the hurdle time after time learning to control those arms.

After a boy can do that and not use his arms for balance, then the next step is to ask him to hook his trailing arm on his trousers. Then he runs and does the same thing, hooking this arm and putting his other arm over the hurdle, as a lead arm should do. We stick with this a long time, although you don't have to stay with it as long as you do with the double arm action because "hooking" is much easier to do. We do this over a period of three or four weeks.

After the boy has mastered this type of thing, holding onto his pants here at the waist, then I let him go and show him that that is the same position I want him in when he hurdles, but he doesn't "hook" now.

Rarely do I find a boy who likes to continue with both arms forward. I have always wished I would find a hurdler like that, but so far in my good hurdlers I have never found one who wanted to continue with it. They all seem to like the one arm better.

I never pay any attention to where a boy takes off for the hurdle or where he lands on the other side of the hurdle. I never call his attention to that. I never make an effort to tell the boy that he has to snap his forward leg down and he has to bring that rear leg forward.

I am probably wrong, but I concentrate on lean and on the arms, and I believe that if one gets the proper body lean and the proper drive into the hurdle, the legs take care of themselves. You have to stop the beginner from taking the leg into the outside or inside, and you have to encourage him to get the trail knee down and the heel and toe up on the trail leg, but I just don't measure inches and feet to and from the hurdle.

I was amused yesterday when they were taking pictures of Hays Jones.

When he came back, I asked him what he did with his lead arm. He said, "I believe I throw that one up." I said, "You certainly do throw it up." That would throw out the window my theory that you should throw the lead arm down over the hurdle. Possibly he has an entirely different form than I teach, or else he leads the arm over the hurdle first and then swings it up.

We talked about the lead leg on the field yesterday. Many beginning coaches (none of the old-timers would say it) say that they like the lead leg to swing up straight. If they do that, they become a buck hurdler, and thus a rather poor hurdler. We all know that you have to lead with the knee and not with the heel. If they try to lead with the heel, it straightens the leg and makes a longer arc that the foot must come through to reach the top of the hurdle.

We have boys coming from high schools who believe that they should be as low over the low hurdle as they can possibly be. I spend hour after hour trying to convince them that they cannot hurdle a low hurdle low; that they have to be erect over a low hurdle so that they can run and "step" the hurdle.

Of course, that doesn't apply to the higher ones. In the highs they really have to get down on the hurdle.

These points are the bases of any hurdle success I have had. I never see boys like Hays Jones, but I have plenty of beginners.

MY VIEWS ON THE HURDLES

By: Percy Beard
University of Florida

I will give you my ideas and theories, although I am a little hesitant to do so. I was just thinking -- if Seaton, Snyder and I were coming along now they wouldn't even take us to a big meet. The way they just run these hurdles too fast now, I don't think they use any ideas, theories or anything like that. They get a "09.5 boy and put him on the blocks and tell him to go, and he goes. I don't think there are many stylists around today.

Everybody doesn't have a :09.5 sprinter, so if you have a :10.5 sprinter who you want to try to run 15 seconds, maybe you should use a little coaching on him.

My idea of the hurdles (I am talking primarily of the high hurdles) is based around one central theme. Hurdling is a running race and the best clearance is that which affords the least break in the running stride and gives the best continuity. Most of the time in a race is spent running and not hurdling. That brings in a few little ideas about body mechanics and use of the arms and legs. What Don said fits right in with the general over-all picture. I can sometimes get a better idea by just looking at the over-all picture and not trying to get too involved in details. What is the general impression that the boy gives in going over the hurdle? What you are looking for is a smooth, continuous flow of action across the hurdle and on the ground into the next one.

If he has that smooth flow, he should not be too concerned with quick stepover and a lot of little things that some emphasize. Don't lose the perspective of the over-all action.

Let's get down to some of the important details.

When you are running or walking, your legs are in a continuous scissors action. One of the principles of physics, as you know, is that for every action there is an equal opposite reaction. Your legs are always scissoring against each other. The balance of one balances and helps the action of the other. That is particularly true in the action of the hurdler. It has to be an elongated running stride, which means that those legs have to be coordinated.

Naturally, it is a much longer stride. The action is longer. The action over the hurdle actually means that when the legs are ready to scissor and are out the left one delays a little as it leaves the ground until the right one gets far enough along to get down, and then they go together.

I have about decided that if you have a hurdler who rushes the trail leg you might as well switch him over to the hammer throw, because if he doesn't do it naturally, he will never do it. That is, he should form right angles at the crotch, knee and ankle.

Take-off and landing, of course, will vary. Some good hurdlers will take off six and a half to seven and a half feet from the hurdle. (I think seven is about par.) If he gets much closer than that, he will simply have to jump "up" to get over the hurdle.

If he is too far back, he has to reach too much. You will find good hurdlers using seven feet as a base, varying a little either way, but not too much. Landing on the other side will also vary. If in take-off and clearance over the hurdle the center of gravity is forward you don't have to worry about getting down on the track. Weight will bring the hurdler down.

You can waste a lot of time working on snapping the front leg down on the ground. You can get to where you can almost step on the hurdle base, but while you are doing that, the guy in the next line is half-way to the next hurdle. So, in all these little details, you have to bear in mind the over-all picture of the action.

One important thing to check is the drive over the hurdle. When approaching the hurdle he doesn't come down like he is taking off for the broad jump. Making a solid heel landing would slow him up. He hits the take-off like any other stride. His heel does not come down, and in the take-off, his leg is just like it is in a running stride, knee leading.

Try walking when your arms are deliberately out of timing with your legs. You know how awkward it is. The action of the arms in running and hurdling should be such that it helps balance the action of the legs and the rest of the body. A lot of the wild arm swinging you can see over the hurdles is to balance some other wrong action. He is out of balance someplace and is using his arms to try to correct it.

You see different arm actions. Seaton mentioned Jones'. His arm is up high in leading, yet he is perfectly balanced over the hurdle.

If you use both arms forward (double arm action), you are departing from all principles of running. You have one arm out of unison with everything else for an instant. Putting both arms forward has no virtue in itself. In coming off the hurdle there is some advantage. The arms sweep back as the body comes in off the hurdle. That is where the advantage might lie. If timed properly, it definitely will bring the hudrler down on the track and running quickly.

It does not suit all hurdlers, or very many. A lot put both arms forward, but they don't know why and they might as well put them back.

Mr. Carl B. Munson (Wooster College, Wooster, Ohio): Will you give a little more detail on the trailing leg and its position as it comes over the hurdles as to whether you reach or put it under your head or arms or what you do with it?

Mr. Beard: My idea is that as it comes across the hurdle, this fore leg is parallel with the ground. The knee just clears it and it stays in a flat position. I don't see any advantage in bringing the knee way up high.

Mr. Snyder: (Ohio State) Does the foot follow the knee across the hurdle?

Mr. Beard: Yes, it follows the knee. If you land in a good running position, it will come through just like that and no power is necessary to get across the hurdle and into your next drive.

Mr. Richard W. Willing (Track Coach, Montclair State College, N. J.): Most of our hurdlers today, particularly indoors where there is perhaps only five yards from the last hurdle to the finish, have developed an uncanny forward lean across the line. I have not been able to get many hurdlers to do much more than bend their heads. I wonder if you have any suggestions about that?

Mr. Beard: By the time they have been in three or four indoor races, they will do it. The lean must start at the hips.

DEVELOPING HIGH SCHOOL CHAMPIONS

By Vernon Wolfe
North Phoenix High School
Phoenix, Arizona

It would take me several days to cover this topic thoroughly, so I will briefly state a few points which I think have helped our kids to achieve the marks they have achieved during the last few years.

When Jim Brewer became the first prep vaulter to clear fourteen feet (he actually went fourteen feet and two inches), and went on to make fifteen feet in his senior year to break the national record three consecutive years, people thought that we had inherited a gifted boy. Of course, they were right. Then came Dallas Long (you know what he accomplished), and this year, Karl Johnstone, making it five straight years a national record has been broken at North Phoenix High School. They may be considered gifted, but only because of hard work on their parts.

Our profession is always open to new ideas or ways to improve coaching techniques, and there are as many different approaches to coaching as we have coaches. No two coaches think alike. I think this is a healthy situation, because you will find that no two boys can be coached alike, and what may prove successful for one might be entirely wrong for another. This makes coaching track and field very difficult and justifies the importance of swapping ideas with each other, such as we are doing today. This exchange of ideas enlarges our bag of tricks so that we can do a better job of coaching. I always learn something new at track clinics; so I have in this session. I hope that I can pass something useful on to you this morning.

Two areas stand out in my mind as the keys to the success we have had at North High. The first is the "psychological" side to coaching-- training minds along with bodies. The second is my "pet," weight training.

Our techniques are important, but they are probably no better than the ones used by other track coaches. I feel that the ones we are using are probably not too much different than the ones we are all using. The importance of techniques depends upon how the mind is prepared to execute them in competition. There, I think, is the key. The mental state of any athlete controls his performance. It is possible to build an athlete's body with exceptional strength and to teach him the best techniques known, and still he may never perform to his potential in competition. Why is this? There may be a reason. I believe it is because his mind has not been conditioned along with his physical development. Occasionally you will find a boy who can develop the mental characteristics of a champion on his own but, unfortunately, this is not the general rule.

I think we high school coaches are a little more fortunate than possibly some college coaches because we get a kid when he is very young. He is eager and often more willing to learn. At this early stage, the coach and the boy must have a mutual understanding of trust, confidence and loyalty. I can't stress this too much. When this relationship is established, all communication between the boy and his coach will be sincere and respected. To be with a boy on the field for two or three hours each day is not the answer. It is not enough time. You must learn all you can about the boy. I refer to his home life, his family, church, friends, interests, hobbies, ambitions-- anything that you feel will help you understand him better.

I think that we are all guilty of getting so wrapped up in public relations work, our own problems, and perhaps in recruiting, that sometimes we don't take the time to know these kids very well. We should never expect young boys or men to perform exactly as we think they should until we know them personally and know what they are capable of doing. We all have heard it said that "to be a champion, the boy must pay the price," and nobody has paid the price more than our champions have. The coach is no exception. He, too, must be willing to pay the price. This may mean giving up a few hours on holidays, weekends or summers to work with your kids when they are there and they want you. It could mean digging into the pocketbook to purchase some weights or a movie camera you can't get through your budget. It is a two-way effort.

You must teach that the impossible can be done. How do you suppose the seven-foot high jump barrier was broken, the four-minute mile or the sixty-foot shot put? Acknowledge no barriers or ceilings.

When a boy gains confidence in himself and his coach, "desire" becomes a key word. With this burning desire we help to eliminate all forms of fear in the boy. This is a four-year process with us because fear causes nervousness which invariably produces sub-par performances. You simply have to teach a winning complex.

Of course, we stress the importance of relaxation. Boys must learn to relax in order to concentrate on the job they are trying to do. Concentration then enables the boy to block out all outside influences which might distract him from doing his best in competition. All energy can then be released where it will do the most good, if the boy is relaxed and concentrating.

I talked to Jim Brewer and Dallas Long when they returned from the Russian tour. I was interested in how they had reacted before the tremendous crowds in Hungary and Moscow which I had read about. They said they weren't even conscious of anyone in the stadium when they were performing. You could almost shoot a cannon off just before those two boys moved, and I don't think it would rattle them a bit. That is how much they have learned to concentrate on the job

they are doing. It is very, very important at the high school level, and I think at the college level also.

We also teach our boys to set goals for the season-- not ceilings. We also teach them to set goals for each individual meet. This is something to point for to key the kids to perform above and beyond something they have already done. The coach can often supply the spark to start this flame.

It may seem odd rather than a coincidence that Brewer, Long and Johnstone set their best marks in the last meet of their careers (a home North Phoenix-sponsored meet at that). You can be sure that the mental stature each boy had attained for this particular meet was the reason behind his outstanding performance. Possessing the ability to be mentally up for a meet is always found in the champion, and this is what separates him from the good track man. I repeat, that is the key-- the ability to prepare yourself mentally for a track meet.

Almost of equal importance is building a strong body to give power to perform well. Weight training is a vital part of our total conditioning program in this respect. We have all been using resistance exercises for years, such as gymnastic work, push-ups, sit-ups, leg lifts, squats, and so forth. Weight training follows the same principle, only using more resistance and developing more strength. Why do so many coaches still fear the iron pills?

To a certain extent, strength is the basic requirement for success in all events in track and field, and I think for any sport. Generally after I say this, I get a sharp reply that timing and co-ordination rather than sheer strength in some instances are more important. But I think behind precision timing and co-ordination is strength! Strength gives the power to execute specific movements smoother and with more force. I believe we will all agree that controlled speed is beneficial to any athlete, and the more he has, the better his marks will be. Weight training develops more fibers within a specific muscle and increases nerve stimulation which enables the muscle to explode or contract with more force. Accepting this, who then, is kidding whom?

Muscle size and body weight can be controlled by weight training, which should eliminate the fear of becoming too bulky. I don't care how many times you lift weights, you are only going to gain weight through your mouth. Muscle-bound? After using weights for the four short years I have used them, I am convinced that this condition lies between the ears of those people who still refuse to accept weight training as a part of conditioning athletes. Perhaps I can swing you over to our side if I show you how agile our good track men have been. Brewer won our school decathlon as a senior. Long, although he did not win it, did a respectable job-- much better than you would suppose. Johnstone placed third this year, and our good hurdler placed second.

I now have a boy who had been lifting weights two years before he came to us at high school. Last year, he was a sophomore, just fifteen years old. He stood six feet three and weighed two-hundred pounds then. He won our decathlon as an underclassman. His name is Wayne Coleman. Due to an injury last year as a sophomore, we may have to wait one more year for this kid to come along for a national record. Last summer he flicked one out about 175. He is looking much better than he did last year. We have high hopes for Wayne. I think his early weight training is the answer. This also should be proof for anyone that weight training, if it is done correctly, will not cause any athlete to become muscle-bound.

A person afraid of weight training feels so because he does not understand it. If any of you here are in this category, I suggest that you learn more about it. There are many good books out on the subject, and many coaches who have been using it for years with good results.

I do not have time to give you our complete training program for all events in track and field, but I think I should bring out some basic things we do in our program of weight training. I am sure that what I am going to say here is going to surprise some of you.

When and how often to we lift? We lift every other day or three times a week. This is done during the summer and fall if the boy is a specialist, that is, if track is his only sports interest. Off season, on the days we don't lift we do lots of stretching, gymnastics and running, recreational swimming in the pool, volley-ball, basketball-- anything to keep moving and relaxed. We continue to lift during the track season. I am sure this is where I may get in trouble in regard to some of the old coaches, but why not do it? Why stop it? Do we stop a pole vaulter from doing his gymnastics or any athlete in track from doing his body conditioning exercises just because the season has started. So why should we stop weight lifting?

We do cut down because we have to spend a lot of time on techniques, like anybody else. We do lift once a week. This period is generally done the day following a track meet. We use the full set of weights, the full number of repetitions and everything we were doing prior to the start of the track season.

In some cases, we lift on Mondays and Wednesdays on a modified scale, depending on the kid and if he has any individual weakness. You will find that we do it during the freshman and sophomore years, whereas in the junior and senior years we have a tendency to taper off the Monday and Wednesday session.

When Dallas was a junior, during the middle of the track season his distance started falling off. We couldn't bring him up. Just by a sheer accident, we had him run through some of his routines and we found that his strength had dropped off considerably. We put him back on the weights and bars.

Lifting during the season will not bother timing at all, because the way we lift weights does not interfere with timing. We have a list of some 30 basic exercises. We group them by body areas. By that I mean arms and shoulders, mid-section, legs and feet, and so forth. Such a wide assortment of exercises insures proper antagonistic muscle development. By rotating the exercises, we make sure each kid at some time or other will do every exercise we have on the list. This will assure that each area is being developed from different angles and it also gives us the wide range of movement that we all want in track and field. All our lifting is done fast and explosive. We feel that the slow, deliberate type has no place in track and field for us. We follow accepted lifting techniques to the letter, such as breathing, body position, etc.

Where strength and bulk is of prime importance, as in weight events, we use the overload or heavy type of lifting, but we still accentuate the fast and explosive lifts. When more endurance is desired along with strength, such as we find in distance running, we use lighter weights, add more repetitions and lift faster. This insures more capillary development within the muscles to give them a greater supply of blood, oxygen, nutriments and it speeds up the removal of waste products.

We use between two and three sets for each exercise, and a boy will use from six to ten exercises for a workout. A workout will last generally between one-and-a-half and two hours. The number of repetitions and weight used will depend upon the event the boy is in and how strong he is. You can't tell by looking at the size of the kid. He may look the strongest, but he is sometimes the weakest.

A flexible rule would be to use six to ten repetitions for the arms and shoulders, and twelve to fifteen for the mid-section and legs. When a boy starts his workout, he will pick his exercises by areas-- legs, arms, etc.-- trying to use more from the area in which most of his work is done. A runner, for instance, if he is using seven exercises, might pick three for the legs, two for the arms and chest, and one for the mid-section along with one for the feet.

We like our boys to keep a chart showing the exercises they are using, the amount of weight they are lifting, the sets and repetitions. This is the only way we have found to keep a systematized program to find out where a boy has come from, where he presently is, and where he is going. If a boy is doing three sets of an exercise, we like him to add five or ten pounds to each set. An example is the Military Press. The first set, he would use one-hundred pounds; the second set, one-hundred-and-ten pounds; and the third set, one-hundred-and-twenty pounds. We do not push the kids to add weight to their exercises as their strength increases, but when they feel five or ten pounds can be handled without straining, we encourage them to do so.

The rest time between the exercises will vary between individuals. Most of the time the kid will gear himself. It will range between two and five minutes with every kid.

Breathing is done on the relaxation phase of the exercises.

There are several ways to lift during a workout. A boy can do all sets of one exercise before he goes to another if he wishes. During the four years we have been using it, the kids seem to do better with the rotation type, where a boy will do one exercise with the arms and shoulders, move to the legs, then to the mid-section, and so on.

There are many, many things for us to learn in this field of weight training. At North High, we are now using only the basic fundamentals in rules or theories accepted by the so-called noted authorities. Positive answers for weight training as it applies to track and field will be furnished only when all of us begin to use it so that we can exchange ideas.

What I have seen happen in the past four years through, we hope, intelligent use of weight training has been fantastic-- something I never dreamed was possible. Consider what three young men did at the age of seventeen years while seniors in high school. Brewer vaulted fifteen feet, which ranked him up seventh or eighth in the world rankings at that time. Then Dallas Long put the twelve-pound shot five feet over the accepted record-- sixty-nine feet and three inches. Two weeks later, he hit sixty-one feet and one-half inch with the sixteen-pound shot. Johnstone this year threw the high school discus 194 feet and 5 inches. He threw the collegiate discus an official 169 feet and 3 inches. He had several in the neighborhood of the 180 feet mark in practice. He weighs 173 pounds and stands five feet ten inches tall.

Something has been responsible for these unbelievable marks. In my opinion, it has been weight training. If it has done this for us at the high school level, it will do the same for you if you have confidence in it and will start working with it.

Mental conditioning and weight training are naturally important in developing a champion, but there are many other things which should be mentioned. One is the use of movies. Any coach, I don't care at what level he is teaching, who thinks his eye can see and remember all the mistakes a boy makes while executing his event must be in another world. I cannot do it. I could never have coached Jim, Dal and Karl without the services of a movie camera. Slow-motion action will show errors, but even more important, I think, they will show where the first mistake occurred, which generally causes several more before the action is completed. That is why slow-motion is so important. Many schools have photography departments which have good equipment. Sometimes they will take

your action shots just for experience. I know some colleges have this set-up. A coach who has these facilities available and does not use them has no excuses. Champions are made, not born.

Let's move on to equipment. You might ask me, "How can equipment be a part of coaching and training a champion?" I think that in the past two years we have read many, many times about shot-puters and discus men who have exceeded world marks or national marks and, because of some technicality, these marks have not been accepted. This happens every year. I think it is a deplorable situation which should never have been allowed to happen. I don't think that we, as coaches, expect the athletes to go out prior to the meet and check this. I think this responsibility lies solely with the coach, and no one else.

I know they have laughed at me a lot out in Phoenix, but I have carried a transit steel tape and scale with me to every meet for five straight years. I have had some embarrassing moments, but any time my kids went to the post, I would go over on Monday prior to the meet and make sure that the place was right. If I told you some of the things I ran into, you wouldn't believe it.

If you have a boy capable of breaking a record-- school, league, state, national, world, or what-have-you-- I think that it is your duty to check all conditions and implements. Check your old equipment and bring it up to standard if it is not right.

I think that specialization at the high school level is the key to developing national champions. You have to work a little bit to keep interest up and to avoid staleness and boredom. Your program should be ever-changing, fun and show improvement. During the track season, we put up a daily workout for each event on three levels: varsity, J.V. and frosh. The workouts are never the same because of the climate. We do not like to put the same thing up day after day or week after week because we do not think it is a healthy situation. Calisthenics are taken individually after two or three weeks of group work so the boys can learn to do just the amount of warm-up to make them ready to perform, just as they would do in a meet.

Tradition has played an important part in our kids shooting for records as high as the national level. We try to keep the interest of the kids high on the track and field. We do this by having lots of literature available-- almost anything which will keep them thinking of track.

Coaching and building a national champion is hard work, but it is most rewarding, too. However, I think we will all agree that if we can help any boy become a good citizen and perform to his potential, we have done something which makes coaching a pleasant experience.

MAINTAINING ENTHUSIASM AND CONDITION THROUGH THREE SEASONS

By "Chic" Werner
Penn State University

Like most schools with three seasons cross-country, indoor and outdoor, we used to build the team up for the cross-country championship, lay off, start in with indoor track, get them in peak condition for a championship, lay off, and start with outdoor track and get them in peak condition for the various meets, Pacific Coast or the National Collegiate, then lay off again and start another year. Then Armas Valste, the Finnish coach, visited our campus.

He told me two years ago that Finland was in its sixth year of continuous conditioning and competition, without layoff. We now do less laying off completely now.

That was two years ago, so right now they have completed eight years of that continuous program, and they are doing very well-- in fact, I don't know who is doing better than Finland in the modern conception of training and conditioning methods. They lead the world in new endeavors and new methods of conditioning and processing the boys.

As "Tug" said in his message to you here about the weaknesses of Americans, especially in track and field, I think one of our great weaknesses is in the walking races and in the distance runs. I can remember where we had a very great weakness in the javelin throw. We were urged to bear down in that event, which we did. Right now, at least temporarily I think, we hold the world's record. I think we are bearing down on distance running and very shortly we will hold a prominent place internationally in that, too.

However, we are always hampered by national traditions and conceptions which get in the way-- things with which you are all familiar. The parents of a boy will go to a track meet and, even if a boy does well or poorly, if he tries to gain a little sympathy by floundering around and stumbling and finally lying on the nice, cool grass or even becoming nauseated, the first reaction of the parent is that there must be a better sport than that for the boy. It doesn't look good. They don't want their kid to grow up in that stuff. Meantime, the coach has been telling that boy how unnecessary it is to die every day or every time he runs, but the kid has seen it somewhere and he thinks that is the thing to do.

I would say that we have offset that, to a degree, over the last fifteen years. Those of you who have been in coaching will recall when we put on the campaigns to ridicule those "dying swans" at the end of the race. We had it almost eliminated, and the greatest setback that I can think of was in Philadelphia

at the Russian meet when everybody in the 10,000 meter run died, except one. It was the darndest thing I ever saw. It was a poor officiating job that hurt track.

We don't have rules to cover it. You have to use your judgment, and I feel that those kids at Philly should have been pulled off the track immediately. Right now in the Pan American Games, the first one of our kids who runs into such distress will be pulled off the track immediately by any one of our coaching or managerial staff. We don't intend to let them reach the point of fatigue that we saw in Philadelphia.

I do think we are getting better in the distance runs. I don't think there is any question about it when you see Archie San Romani and young Burleson and others running as well as they are before they get to college. Then when we see our college boys performing the way they are right now, I think we are on the way. But we have those stumbling blocks.

I am supposed to talk about how I managed to maintain enthusiasm from September through September during three seasons. I don't know how we do it. In fact, I'm not sure we do it, but if we do it has been done from what I gathered from the foreign coaches on barn-storming trips and other trips where they have the continuous program.

The system that we have followed at Penn State to bring this about is something like this: at the beginning of cross-country (I would say for the first three weeks when school starts in the fall), we work out seven days a week, and for the most part twice a day. We go out early in the morning and take what we call a slow distance run. How far we go depends upon the maturity of the boy and the stage in running he holds. In the afternoon, we will have an organized conditioning program of some sort, and most of this is basic conditioning.

After three weeks, when we have reached a semblance of being conditioned-- mind you, only a semblance-- that is what I call it when a kid out for four or five mile cross-country can finally cover the distance without walking. Maybe it is a little better than that, but in some cases that is about it.

From then on, because school is under way, we get down to running once a day, and only every other day. They report for practice seven days a week, but every other day we have a good, tough workout. The boys know that if they work hard today, tomorrow will be comparatively easy, so they do not have to hold back in today's workout and save something to be alive tomorrow. Tomorrow they can recover from today.

We continue through that and, as we approach the end of the season which is about two months from the beginning of indoor track, maybe two-and-a-half, then we have reached the point where we only have one hard workout a week in

addition to the day of competition.

Following the cross-country season, I would say they almost lay off running for a period of three weeks. During that time, they play handball; they go out for intermural wrestling and do all kinds of things that they shouldn't do--play basketball and sprain ankles-- but nevertheless they are active in something, which is a diversion from running, and I think it is very healthy that they do that.

We come back in indoor track. We have three weeks of continuous workout twice a day, and we reduce it to every other day for a hard workout, and as we near the end of the campaign, to once a week.

The outdoor track season is exactly the same.

Now, I have one of our boys here, Ed Moran (4:01 miler), and I don't think we ever presented this stuff to the team the way I have given it to you fellows. Have you ever heard of anything like it at the school?

MR. ED MORAN (Penn State University): Not as you have mentioned it. It is along the pattern, but I never thought of it that way.

MR. RALPH HIGGINS (Oklahoma State University, Stillwater, Oklahoma): When do you have time to get twice-a-day workouts while school is going on?

MR. MORAN: We sort of prepare our schedules so we have an hour in the morning. The workouts we take only last twenty minutes or a half hour--twice-a-day workout in the fall. We usually get there a week before school starts and during the first week of school it is not hard.

CHAIRMAN SNYDER: As to the morning workouts, do you run before breakfast or after breakfast?

MR. MORAN: I usually run after breakfast.

MR. HIGGINS: What does your morning workout consist of, say, the twenty minutes or so?

MR. MORAN: Most of it is just a run around the golf course, which is about two miles. It is not hard at all. Just a pretty good sprint. You are never too tired afterwards.

MR. WERNER: Does this business of working three weeks, seven days a week, and then getting down to every other day, and then only once a week--does that recall to you the way we did it with you at all?

MR. MORAN: Yes, from about the middle of the season on we only have one hard workout a week. On Sunday, we just jog around, and Monday, we just jog around. Tuesday, we take it easy, and maybe Wednesday have our speed workout, or whatever it is, and Thursday and Friday jog around and have the meet on Saturday. That is a little past half way.

MR. FRED WELCH: Do you work every day during the season, seven days a week, all through the season?

MR. MORAN: We work every day, but not hard.

MR. WELCH: But you train every day, not that you necessarily work every day?

MR. MORAN: Yes.

MR. WERNER: Now, Ed, while I have hold of you here, let's take this last year. This has been a son-of-a-gun, I would think, for you and some of our other boys. We were quite active in cross-country, and I think we had a respectable team, but not good-- right?

MR. MORAN: Right.

MR. WERNER: A lot of the fellows beat us. We did win the IC4A indoors and outdoors. You had to be on your toes trying to get ready for all this. Did you get weary during any season or between? Be honest. Tell me. I have never asked him these questions before.

MR. MORAN: Toward the end of every season, we do get a little tired, but we don't work so hard that we get too tired. But we always have in mind that in a few more weeks, we will be indoors. We look forward to running indoors. Miles seem so easy after five cross-country. It seems like a breeze. After three months of indoors, we get tired and say, "A couple more weeks, and we will be outdoors." And then when we get outdoors, we look forward to starting that. I think the change in the conditions and environments helps.

MR. WERNER: Would you say this, Ed; that as you leave cross-country for indoors, and leave indoors for outdoors, that you find everything getting progressively speedier?

MR. MORAN: Oh, yes. After cross-country, that is all we work on for the first couple of weeks-- speed.

MR. WERNER: I think that is the basic idea. You start out trying to get basic condition with slower workouts, and toward the end, you have reduced

yourself to nothing but wide-open speed.

Now I think we should discuss here some varied methods of working out. Ed, if you want to get out of the hot corner there, please do.

Let me give you a number of types of workouts, and we will discuss each one of them briefly. They cannot be discussed thoroughly in just five minutes.

We have always assumed that the best track coaches were former hurdlers, like myself and Larry Snyder, but now and then a "foreigner" will sneak into the pack, like a long-distance runner or something. I have been looking around this room, and you would be amazed at the number of former distance runners putting me on the spot with their eyes. Anyway, all you fellows who have been former distance runners, raise your hands. Among these distance runners giving me the fish eye are a number who have held former world records.

Now, you fellows who have ever touched a world record, whether it has been accepted internationally or not, hold up your hands.

It's quite a trick for a broken-down hurdler to be telling distance runners how they ought to do it. Anyway, I will take a crack at it.

One method is what I call "ins-and-outs" for conditioning. You can call it anything you like, but what we call "ins-and-outs" is a run which is broken up by intervals of slows and fasts. I would say that in cross-country, you may send a boy out to run three, four or five miles, breaking it up every hundred yards, every quarter of a mile, every 220, according to what you think he needs. Or on the track you may send him out to run a mile doing it that way or, better yet, if you don't want to have a certain distance, you may just say, "You run around for a half hour, intermittently slowing down and speeding up." There is a value in that, and I would say that the value is basic condition.

We have another workout that I think is probably my favorite, and we call it the "slow-fast." A "slow-fast" quarter, in my book, would be one in which a fellow starts out and runs the first two hundred yards or the first 220 at somewhat of a moderate speed and then builds up the speed for the finish of that quarter. A "slow-fast" is just exactly what the name implies. It starts out moderately and builds up. If you are running a "slow-fast" quarter, you may be timing the first 220 and you may suggest to the boy, "Do 220 in 30 or 31 seconds and then kick it." He will run a series of 31's - 25's.

That workout has the distinction of providing a strong finish for a boy in a cross-country or any distance run where the boy doesn't have a good kick at the end, and this "slow-fast" workout, I think, is hard to beat for providing that.

Now we have a pace workout. A boy is a 4:10 miler or 5-minute miler, and you may say, "I want you to run a quarter at a 5-mile pace, or a quarter at a 4:10 pace," or "I want you to run a mile at a 5-mile cross-country pace." It might be that you will do repeat work and what-not, but that pace is mainly for the purpose of letting him get acquainted with that so his judgment will be all right.

We have one called "wind sprints" or "pick-ups." "Wind sprints" mean you run 180 yards at three-quarters speed and the next 40 yards wide open for the 220. We will run "wind sprints," a series of those, with speed down to three-quarters, kick to the end of the 220, walk back to the pole vault, and continue on. We do many of these.

When we start a campaign, we start out with the "wind sprints" and we assign a series of ten of those, with just walking back, for the whole squad almost daily for two weeks. At the end of two weeks, the kids are ready for everything else.

Next, we have "repeats," wherein you will run a series like this, for example: here is a workout Bill Dollinger assigned for Moran the last Friday here getting ready for a meet in Buffalo yesterday and for the Pan American Games. Ed ran a quarter-- in what, Ed?

MR. MORAN: I hit 56. I was supposed to hit 58.

MR. WERNER: Then you jog or dog-trot around for a quarter, and then you ran a half lap-- in what?

MR. MORAN: 23

MR. WERNER: Then he jogged around for a quarter and then he ran the next quarter in...

MR. MORAN: 58 seconds.

MR. WERNER: 58 seconds. Well, that is what we call "mixed repeats." I would say that at the peak of a season anybody who wanted to do more than one or two of those in a day should have his head examined or have his coach's head examined, because that is pretty rough.

Even "repeats" is a series of even races. If you are running quarters, you run a quarter at that pace-- whatever you are assigned to do-- it might be 68 seconds or 58. Whatever it is, jog, and when you get around again, do another one-- jog, get around again and do another one. You keep building up the number of those according to the condition and maturity of the boy.

We have a crazy thing in cross-country called "Indian file." I think you all know what it is. A bunch of kids get in single file. They are going to run a path around the golf course. They are all dog-trotting along, and the last guy sprints from last place to the front. When he gets in the front, the next to last guy sprints and gets in front. It keeps going like that. The thing that makes it possible to do without breaking up is for the front guy, when he gets up there, to cut his speed down to the speed of the others, but if he keeps going and they have to go to catch up to him, these kids will string out for 120 yards, and when the last guy starts to get up in front, it gets tough. It is kind of an interesting thing to use just to break up the monotony.

We have another one called "4-minute mile workout" wherein you can take the segments of the mile-- 220, quarters, halfs, or whatever you wish-- and run them so that your times will add up to a 4-minute mile or better. If you are going to run quarter miles, then you have to run four 60-second quarters. The trick in this workout is to have this all end within a certain specified time.

If I say, "I will give you 20 minutes to run a 4-minute mile in different portions; pick out your parts," you will find they will run a half mile, a couple of 220's and a quarter. Some will do all 220's. Some of them will want to run it in 2-minute halves. In the 20 minutes, they have to use their own thinking in order to get their recovery.

I would say a couple of weeks later maybe you will cut that down to 15 minutes.

When I first learned about this, we had a high school coach from Long Island who told us he had the high school kids running a 4-minute mile in 10 minutes. I have had a lot of kids who could run the mile under 4:10 and I had very few who could do it in 10 minutes.

MR. MORAN: We had quite a few who could do it this year.

MR. WERNER: We have three relay teams with five men on a team. There is no time set on how fast a man should run a quarter, but if he has red blood in him, he wants his turn. It is a touch-off with no baton and each man runs until he has run either three or four laps. His only recovery now is while the other four fellows on his team are running. Do you follow me? It makes kind of an interesting workout.

I could go on and on, but I hope that the suggestions I have given and the discussion we have had will help to give you some idea how varied your program can be.

INTERVAL TRAINING

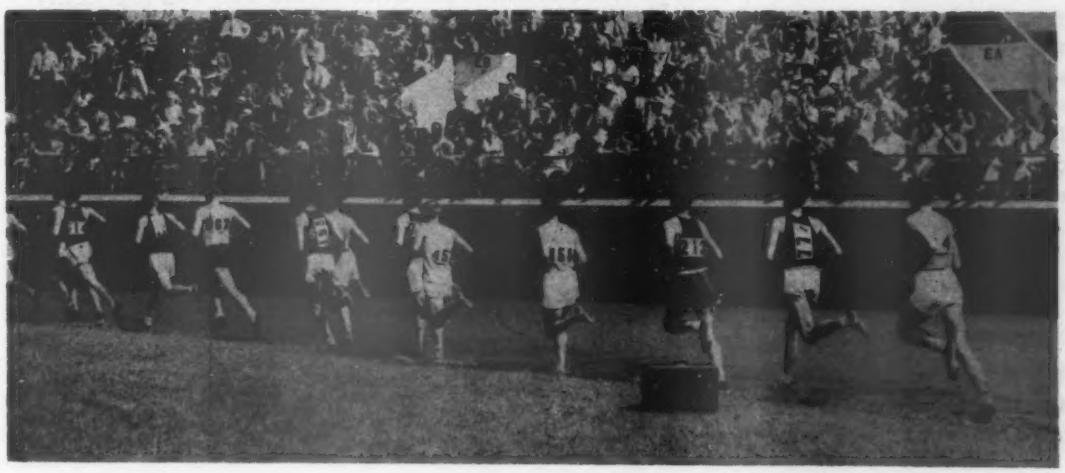
By: Ted Haydon
University of Chicago

Interval training is development, as I see it, which comes from the Swedish "fartlek" type of training. This is the training where a fellow goes out in the woods and runs intermittently fast and slow -- sometimes wearing heavy boots. "Fartlek" literally means "speed playing" in Swedish. I spoke at a clinic downstate this year, and after I got through, a fellow came up and said, "Could you tell me, Mr. Haydon, where I could get Mr. Fartlek's book?" I told him he hadn't written it yet!

However, in fartlek the runner runs as he feels. When he feels like running fast, he runs fast, and when he is tired, he slows up and jogs, and runs slowly until he feels good, then he runs fast again. In short, he plays with speed.

Our interval training is an off-shoot of that type of training.

There are a variety of interval training programs. Some people differentiate between what they call repetitions and intervals. I say that repetitions and interval running are the same thing. In a repetition, the interval is almost a full recuperation or a set time of five or ten minutes between the repetition. By that I mean a man runs a quarter in a certain specified time, takes a certain specified rest of five or ten minutes, or until he feels fully recuperated, and does the same thing again. He may repeat that five or ten times. In this case the quarters might be pretty fast.



The rest interval is specified, either in time or in terms of recuperation. The interval ranges from where the recuperative running is almost as fast as the training running. I have seen fellows out here you would have to look at twice to tell if they are jogging or running -- 75-second quarters with 76-second jogging in between.

That might be a little extreme, but we have some fellows who are extreme. They may do a 32-second 220 with a 32-second jog between them, carrying two watches with one timing the run and the other timing the interval. So there is a wide range from fast repetition with a rest based on a set time or recuperation to the type of run where there is hardly any perceptible change between the running and the interval period at the slower pace.

I would like to differentiate between the three types of interval training programs. There may be more, but these are the ones which I have observed in use.

Type A is the type where you hold the time of the run constant and adjust the interval and the number of the repetitions to the ability of the runner. A boy may say; "I am going to run: 70 seconds for the 440, or: 25 seconds for the 220, or 1:40.0 for the 660. He runs one, and then he rests a certain amount of time, and then he runs another. If he runs one in 1:42.0, he takes a little more rest until he can try and run another 1:40.0, and when he runs 1:45.0 and he can't run another 1:40.0, then he quits for the day.

In other words, he tries to hold the time of the run constant and adjust the interval and the number of repetitions to condition and ability.

Type B would be where one holds the time of the interval constant and allows the degree of recuperation to determine the time of the run and the number of repetitions. This is a man who says; "I am going to run 440's, jog two minutes in between them, and I am going to run them at whatever speed or pace feels comfortable, and I will repeat them as many times as I can without undue fatigue." This is really the type of program where you may hear a fellow say; "I am going to run interval quarters, and I will run for the month of October in 70 seconds, and in November 69 seconds, and in the month of December I will run them in 68."

This is an objective type of interval running but it is based on how he feels. The time and the interval is very important to this type of running.

Type C, or the third type of interval training, is where one holds the time of the intervals and the number of repetitions constant. This is a man who says, "I am going to run ten quarters in whatever time I can, with a one-minute-and-a-half jog. As my condition improves, my timing will come down so in six

months, I may be running 66's."

Thus, we have three programs where the count is held constant, the interval and the number of repetitions constant. Of course, everybody feels that interval running builds strength and endurance, and it does. It develops the entire muscular system to be accustomed to hard, repeated running at a race pace. So, if we want to improve this condition and build greater endurance, no matter which of the three programs we use, we come down to the three basic essentials. In order to step up your program, you have to add more repetitions, faster runs, or shorter intervals. Whether you are on the A program, B program or C program, in the long run, it adds up to pretty much the same thing.

If you shorten the interval and slow up the run, you may not gain anything. If you speed up the run and lengthen the interval, you may not gain anything, except, perhaps, the ability to do speed work. If you do more repetitions at a slower pace with a longer interval, or more repetitions with a shorter space interval, you may lose as much as you gain. You may gain some in stamina at a set pace and lose some of the speed ability.

The advantages of interval running are several. First, it definitely is a gentler method of early conditioning. Today, in some places, distance running prospects who have no background or conditioning for distance running are told to go out and run distances which they are not in condition to run. The more determined they are, and the more enthusiastic they are, the more likely they are to have a bad experience with running so hard when they are not in condition for it. They suffer undue physical and mental reactions as a result of the run which may give unfavorable reactions toward distance running.

The same runner will do well when introduced to distance or cross-country running through a progressive program of interval training where he can come out and run a couple of 440's one day and a couple of halves or 220's and gradually increase the number. When a boy can run ten 440's on the grass inside the track (and I don't prescribe the interval in the early stages) and walk rapidly between, he can go out to the cross-country course and run three miles without stopping. Of course, when I take him out there, I always tell him he always has the privilege of stopping if he runs out of gas. This is a good psychological move, because if he knows he can stop, he is less likely to stop than if he thinks he just has to keep running.

When a beginner is in the early stage of interval running and is trying to run a 75-second 440, the minute he hits an 80 or 83, I stop him and tell him that is all for the day. If we don't do this he will reach a point where he can't keep it up and he has all the good he can get. You could drop his pace but I prefer to keep up the speed work around the five-minute mile pace, or better, for cross-country work.

Another thing that interval running does is to allow conditioning to develop at a race pace. Some fellows think they can develop conditioning by going out and running six-minute miles and running a lot of them. Well, running six-minute miles isn't training for five-minute miles. You can't train in running a lot of five-minute miles unless you are in good shape, but you can do as many of the intervals (220's, 440's, 660's or halves) as your condition will permit at the five-minute pace, or better. You can do your training for the year at a pace that you are going to have to run in the competition you are training for. That is a must.

The third advantage of interval running is that you can get a maximum return of results in a minimum amount of practice time. It is simply economical from the standpoint of time. I feel, however, that the interval runner who thinks of his interval running only in terms of time makes a mistake. I think the the distance he is covering is important. A fellow who sits for 30 seconds is not getting the same thing as the fellow who jogs for 30 seconds.

There is variety, too, in interval work. Some fellows say they run twelve 440's in 65, and some will run eighteen 220's in 28. My feeling is that the possible patterns are infinite and the basic advantages of interval running can be acquired through any number of different types of training schedules. They must, of course, involve repeat work with an interval of recuperation which is so short that it slows up the time of the running or so long that the run is too easy.

I was interested last summer in hearing about Latimer Cook's training. Latimer Cook trains hard only two days in a row. He spends the third day in a hot bath. His interval is determined by his ability to recuperate. If he is running 65 seconds for 440, he finishes the 65-second 440, and if he feels ready to run another one at the end of the fifth jog, he may take it. If he doesn't feel ready, he may run 300 yards or more until he is ready, and then run again.

One of the disadvantages of interval work is that it may be monotonous if carried to an extreme. A dedicated distance runner who has a set program he has worked out himself if self-motivated and ambitious, and he may have the desire and the stamina to run an interval program every day that he trains. I doubt, however, that this is practical for the boy who is out for track for the fun of it. To him, it is just one of several activities, including the academic and social, and he doesn't want to go to his studies at night if at all tired. He likes to have a little more variety in the program. If you keep telling him to run 220 or ten quarters day after day, and day after day, he does not have that motivation of the older runner and he may balk at such a seemingly monotonous program.

Another disadvantage is that there may be a tendency to neglect speed work. Boys often think about reducing the interval and increasing the number of

repetitions, and may forget about speed work. Some all out speed work has to be included in all interval programs.

It is my view that the advantages of interval training far outweigh the disadvantages. In working with college boys, I feel that interval training is a vital part of the program. It would be the last thing that I would eliminate from my program. If I had only one day a week to run, I would do interval running. I have the boys out four or five days a week and I feel that it is helpful to relieve the monotony and do a couple of other things to give them a little variety. In addition, we do over-distance work for confidence.

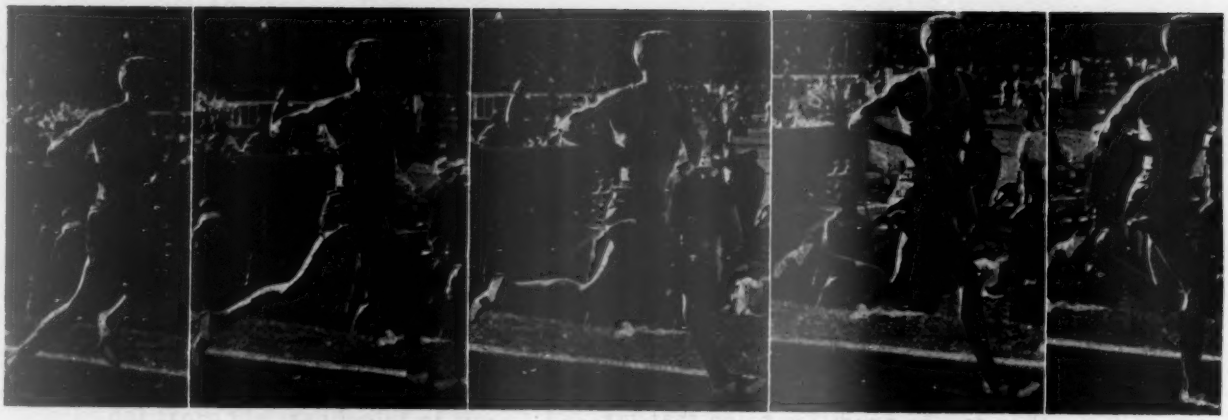
So, some long distance running, I think, is helpful to young boys. It lets them know they are in condition to go that far.

Another thing I like to do is give them some speed work. I feel that in developing a runner I usually try to mix them up from one event to another, too. If a fellow runs a half mile, then a mile, and next two miles, and comes back and runs a half, especially in a young runner, he gets an idea of which event he likes best.

I had a fellow who came out as a sprinter; I converted him to a hurdler, and then he started running the quarter. He ran 660 of distance for the quarter. He ran such a good 660 we moved him to the half, and then we got him to come out for cross-country and he ended up 17th in the National A. A. U. in the 6 mile race. His interest now is strictly in the long distance running. If you don't mix it up I don't think you will ever know just how much speed a fellow has or what his abilities are.

I have felt for a long time that because we use interval running we are really in a better position than our student health department to tell whether our boys are well or not because illness will show on an interval training program. If you know a fellow is capable of a certain thing, the minute he is running 65 and turns up with a 70, then is the time to wonder what is up. Usually, if you ask him, you will find that he either had a tough week-end, or some problem has come up, or he hasn't been sleeping well or he may have allergies.

Interval training gives the coach - if the coach pays attention to it - a fine index of a runner's general well being.



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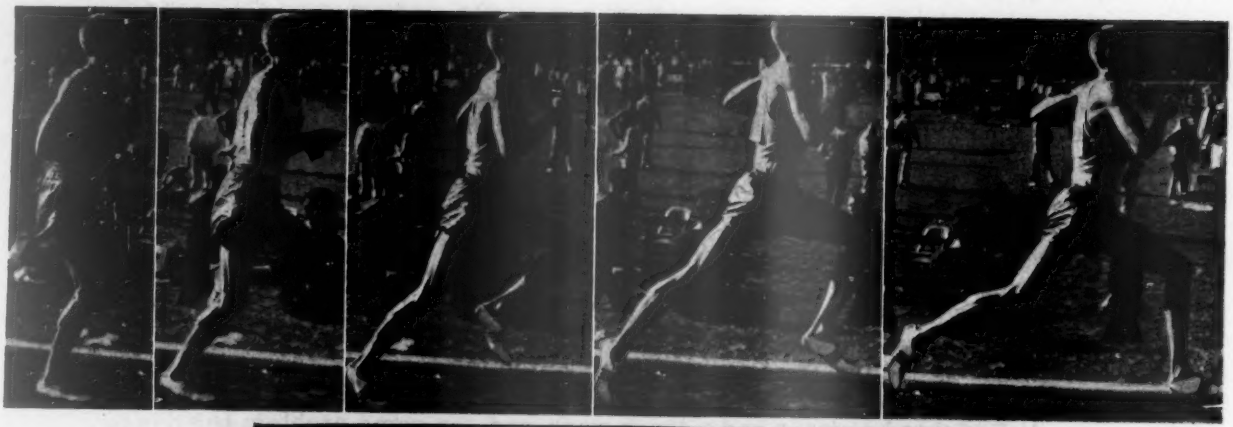


DYROL BURLESON, AAU Champion

1. Illustration 1 shows the angle of Burleson's arm is less than 90°. He is breathing through his mouth. 2. In this illustration, Burleson has brought his left arm across his chest a bit too much, causing his right arm to swing wide. 3. Notice in Illustration 3 that his right foot is coming down for a good heel-to-ball landing. 4. Burleson's easy leg action is shown here as his heel-to-ball landing is almost directly under the center of gravity. 5. Illustration 5 shows Burleson passing over his slightly bent right leg. 6. In this illustration we see the complete relaxation of Burleson's left (recovery) leg. 7. Compare the better position of his right arm with that of his left arm as shown in Illustration 2, thus making for better "straight-ahead" action. 8. Notice the excellent position of Burleson's right arm. 9. The right leg thrust is efficient and powerful. 10. Burleson is in a relaxed position as he begins the next stride.

OBSERVATIONS IN MIDDLE DISTANCE RUNNING

By Fred Wilt
Lafayette, Indiana

Recently I have had an unusual experience in gathering material with which to write training and performance biographies of approximately 150 short middle distance and long middle distance runners (880 yards to 6 miles) of all abilities from various countries. These are currently being published in book form by Track and Field News under the title "How They Train." Examination of the specific training routines of Alf Shrubb (world record-holder for two miles in 1904 at 9:09.6), Paavo Nurmi, Glen Cunningham, Gunder Hagg, Emil Zatopek, John Landy, Roger Moens, Tom Courtney, Herb Elliott, etc., makes it obvious that there is no one best way of training. Those in search of the perfect system may never find it. It would be difficult to prove that one system is better than another. The same athlete may thrive or fail equally on a number of different training routines. Individual differences will always cause some techniques to work with certain athletes while the same training might be unsatisfactory for another. Perhaps the wise policy for a coach is to have a working knowledge of many different training routines, and if one proves unproductive with a specific athlete, then try another. There may be a correct way of applying each method, and the same routine may be applied in an irresponsible manner with less than best results. Recognition of the value of different training routines and respect for individual differences in athletes should prove an asset to the coach. Great athletes are apparently great for reasons other than, but in addition to, their specific training. Successful racing involves not only good training and natural ability, but also (and even more important) mental factors such as determination, tenacity, courage, and perseverence. Training makes good performances possible, but these mental factors must be added to transform the training into the reality of successful athletic performances.

The training of 18-year-old Robert Vagg of Australia seems unique to the methods generally employed here and represents an approach to training involving gradual adaptation to stress. It seems typical of that used by Australians today who are not followers of Percy Cerutty and Franz Stampfl. Vagg's workout routines are described for the purpose of illustrating that the workouts of this great young performer are within the means of accomplishment for many of our high school athletes. Note that Vagg's training speed is considerably slower than proposed racing speed, the number of repetitions is high, and the recovery period between repetitions of running is quite short.

ROBERT VAGG, Sydney University, Australia, Age 18.

BEST MARKS: 3 miles, 14:27.6; 2 miles, 9:02.6; mile, 4:14.0; 880 yards, 1:57.0; 440 yards, 53.5; 220 yards, 24.8; 110 yards, 11.0 seconds.

Born 2/2/40 at Sydney, Australia, 5' 8", 138 lbs., started racing in 1955 at age 15.

PRE-RACE WARMUP: Jog 30 minutes very slowly, with 6 to 10 x 30 yards fast striding near end.

PRE-TRAINING WARMUP: Jog one mile slowly.

PRE-COMPETITIVE SEASON TRAINING:

Monday: 5 miles in 30 minutes. Timed on grass track. 90 seconds per 440 yards pace.

Tuesday: 20 x 440 yards in 90 seconds each. Jog 110 yard in 30 seconds after each.

Wednesday: 10 x 660 yards in 2:00 minutes each (80 seconds per 440 yards pace). Jog 220 yards in 1 minute after each.

Thursday: 6 miles fartlek (speed-play) over unmarked area in woods with many short, fast surges enroute. A solid workout. Not timed.

Friday: 6 x 3/4 mile in 4:00 minutes each (80 seconds per 440 yards pace). Jog 440 yards in 2 minutes after each.

Saturday: 20 x 440 yards in 80 seconds each. Jog 110 yards in 30 seconds after each. Timed on grass track.

Sunday: 10 miles steady pace cross-country run.

COMPETITIVE SEASON TRAINING:

Monday: 5 miles in 30 minutes. Timed on grass track.

Tuesday: 12 x 440 yards in 70 seconds each. Job 220 yards in 1 minute after each.

Wednesday: 6 x 3/4 mile in 3:45 each (75 seconds per 440 yards). Jog 440 yards in 2 minutes after each.

Thursday: 10 x 660 yards in 1:55 each. Jog 220 yards in 1 minute after each.

Friday: 4 x 1 mile in 5:20 each. Jog 440 yards in 2 minutes after each.

Saturday: 10 miles steady easy pace cross-country run. Not timed.

Sunday: 10 x 220 yards in 32 seconds.

As often as six times per week Vagg joggs 6 miles in the early morning in addition to the usual one hour daily workout at 5:30 p.m. described above. He does not rest completely prior to racing. Before ordinary races, Vagg joggs 4 miles the night prior to competition. Prior to important races he joggs only 4 miles each evening for three days prior to the race. Vagg participates in 15 cross-country races, and 20 track races annually. He eats nothing for three or four hours prior to racing. He is coached by Bryce MacKay, and he does not engage in weight training. In Australia the cross-country season extends from April to August. Vagg rests from the end of August for one month and resumes training in late September for track season, which extends until March. Vagg recommends slow training as the secret to strength, maturity, and the ability to work longer. Due to lack of finishing kick, he frequently sets pace throughout his races, surging often in longer races. He starts his finishing drive for home in mile races about 660 yards from the finish, always attempting to reach the third lap in the lead.

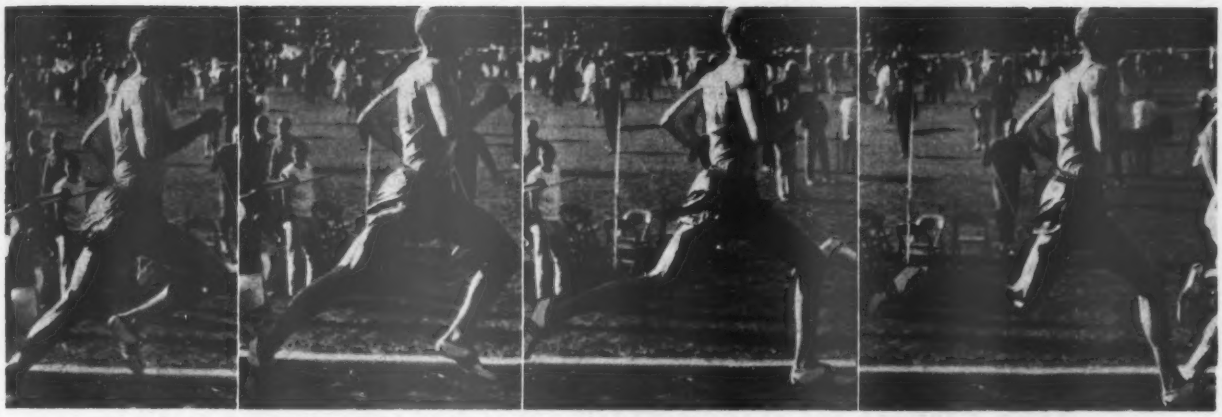
Track training and performances involve many questions, most of which have many answers, and all of which may be correct, depending upon circumstances. Training should be a daily process, and in some cases may involve multiple daily workouts. Recovery between workouts must be complete. The total quantity (distance) of fast running covered each workout, exclusive of recovery jogging or walking, can be two or three times the actual racing objective. It is entirely possible that modern day training has sacrificed continuity for the sake of ever-increasing numbers of short distance repetitions. The ability to repeat tremendous numbers of 220, 330, and 440 yards intervals cannot guarantee that the middle distance performer will be able to successfully negotiate the full racing distance at a reasonable speed in consideration of ability and volume of work performed. To achieve maximum preparation for competition, the duration of distress encountered in training must be sufficiently prolonged to duplicate the physical and psychological disturbances experienced under actual racing conditions. This is best accomplished by including a sufficient number of training runs at distances from 3/4 to 1-1/4 times the proposed racing distance, with some relationship to racing speed, although by necessity these longer, repeated training runs should be significantly slower than actual racing speed.

It is popularly believed that training must be faster than proposed racing

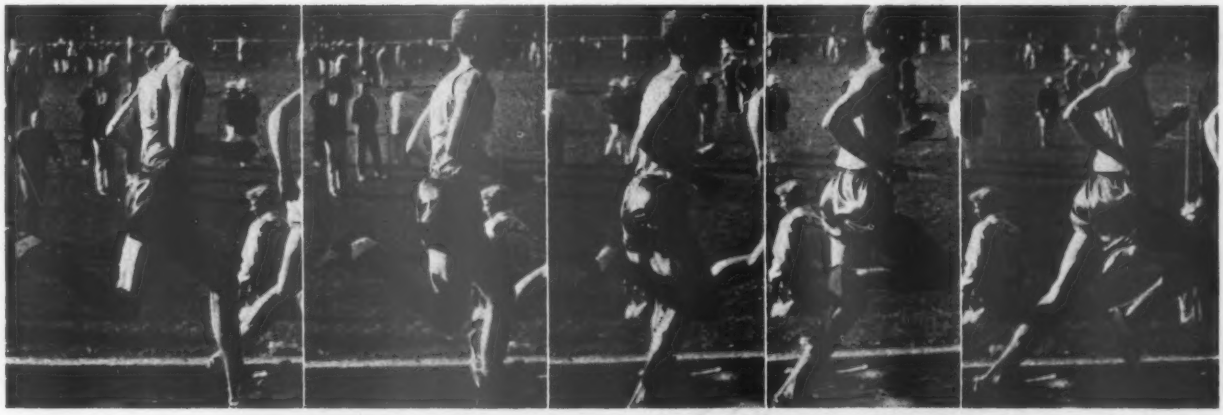
speed to be effective. This brings up the interesting question of how Merv Lincoln of Australia was able to race over the full one mile distance in 4:02 at a time when his training speed was no faster than 64 seconds per 440 yards, and how Emil Zatopek of Czechoslovakia was able to establish world records in 5,000 and 10,000 meters when his training consisted almost entirely of many (20 to 60) repetitions daily of 400 meters in 75 to 90 seconds each, with 200 meters recovery jogging following each. One explanation might be that the human organism has amazing powers of accommodation, adaptation, and overcompensation if given the opportunity to exercise them. Vaccinate a man with a small dose of appropriate strength vaccine and the body adapts itself to this small infection (stress). It overcompensates by producing antibodies of sufficient quantity to ward off and withstand exposure to the disease at a future date. Break an arm, set it properly, and nature overcompensates by healing the break so thoroughly that it is relatively impossible to break the arm in the same spot again. Vaccinate the runner with a low stress of running (80 seconds per 440 yards repetitions, for example), the body adapts to this low grade stress, and overcompensates in the resistance it produces to this intensity of running. Then, on the basis of this adaptation and overcompensation, the body may (during the excitement of competition) race at a much faster pace. This indicates gradual adaptation to stress should be one objective in any training program.

The extent to which any athlete approaches the limit of his potential is a matter of interesting speculation. As an indication of the fantastic physical potential inherent within each human, Edinburgh University's Professor Alexander Kennedy, in his speech before the British Senior AAA Coaches in 1958, suggested that the determination which enabled primitive man to kill lions must somehow be adapted to sport. Referring to this ability, Professor Kennedy pointed out that a lunatic having a "brain storm" becomes so powerful that seven experienced men are often quite unable to restrain him. In this condition, the lunatic is able to smash iron bars and oak woodwork. Yet when he is recovered he cannot possibly do these things. In fact, he is not as fat or as strong as any one of the seven men he has recently overpowered. If this strength and will power of insanity could be coupled to the trained and technically correct athlete, what could we not accomplish? Kennedy feels that educated mental determination coupled with physical perfection will soon be insufficient to win an Olympic title. He thinks that the athlete will soon have to add a peak of almost psychological fanaticism to the high plateau of physical condition to achieve the Olympic crown.

As we look to the future we cannot avoid the question of the ultimate limits of human potentiality in middle distance racing. A more thorough application of known principles of training, future scientific improvements and refinements in training, a more universal application of weight training principles, dietary research, group dynamics, and psychological preparation all point toward better future performances. Yet the important issue in future



COMMENTARY BY BILL BOWERMAN



JIM GRELLE, NCAA Champion

1. The illustration shows excellent arm carry at slightly less than 90°. Grelle's leg action is efficient and not exaggerated. 2. Good powerful thrust with the right leg and foot is shown here. His left leg is not overreaching. 3. Notice that Grelle's arms are in an economical, efficient position and he is in a relaxed stride position. 4. His left foot is coming down for a "flat" landing and his arm is slightly across his chest. 5. Again the arm is at slightly less than a 90° angle. 6. This illustration shows an excellent "flat" left foot under the center of gravity. Grelle's right leg is relaxed in the recovery. 7. He is ready to "jump" the opponent and go into a sprint. 8. It will be noticed here that his left arm is leading his right leg in an efficient, economical stride. This illustration also shows the beginning of the left leg thrust. 9. The economical arm carry and swing are noticeable here.

improvement seems not to be these factors, but rather in the direction of greater numbers of participants. In America, it is conservatively estimated that considerably less than 5% of our youth participate in Track and Field, and much less than 1% engage in middle distance racing. Hundreds of millions of the world's colored population ignore the sport. The future will undoubtedly bring higher standards of living, decreasing working hours, more free time for training and competition, greater opportunity for participation, and vastly increased numbers of participants. I feel that (short of the absurd) no accurate prediction is possible regarding the ultimate limits of middle distance performances, because such a prediction must be based upon human evolution and the character of social existence in the future.

CAN WE IMPROVE OUR WORLD POSITION IN DISTANCE RUNNING?

By Joe Mangan
Southern California Striders

Gentlemen, my topic is "Can We Improve Our World Position in Distance Running?" The best way to handle this topic is to answer, "Yes."

In the United States, we have done so little with distance running in the past quarter century that we all hope there is no way to go except up.

Excluding the dynamic Ashenfelter's win in the steeplechase, we have to direct our memories back to the 1932 Olympics in Los Angeles to find a World-Class Performance in the distance runs. Many of you remember Ralph Hill's powerful surge off the last turn in the 5,000 meters (and the contacts with Lehtinen, whose racing tactics were open to some question), which contributed to his second place instead of the Olympic championship.

United States track officials are not proud of the fact that we have to go back twenty-seven years for a highly significant World-Class Performance.

Now, what can be done?

In my opinion, there are three age and developmental levels at which our coaches should act: first, high schools; second, colleges; third, clubs.

Let's take a look first at the high schools and consider implementing the following plan. For lack of a better name, let's call it a "Nine-Year Distance Plan."

Here are the preliminary steps: first, see to it that high school principals and boards screen applicants so that the track coach is a man with a real interest in track. All too often he is a teacher who aids in coaching the contact sports and along about spring, for the first time in the year, he said, "Come on boys, we have a meet three or four weeks from now. Everybody out for track." The kids appear in their argyle socks and sweat suits and start running.

Next, have this interested man get all the boys out in the fall for cross-country. Just jog one or two miles on the grass. Don't take the nearest cinder track. Forget stop watches. Let the beginners straggle after the experienced boys-- otherwise how can they ever improve?

Third, promote interest. We plan to send several prominent distance men on lecture tours. We will provide them with a closely contested 5,000 or 10,000 meter race and let them narrate it and take their workout with the boys

joining in for a limited portion.

I still remember when, as a high school boy up in Rutland, Vermont, Charley Paddock came up there with a short lecture and a talk. The youngsters there later also raved about Clarence DeMar, who came up to jog six miles one day on the high school track purely as an exhibition to get the boys interested. He lost a shoe at three miles, and still he continued for a six mile run. As a result of DeMar's visit, the local high school coach told me that his cross-country season developed 300 per cent in the number of boys who came out.

Further, motivate these boys to run in the fall by giving simple rewards. Give them a small plaque or paper certificate signed by the coach they admire and respect. Start a short cross-country race at the half-time of football games. Let them run out on the field for one, two, or maybe two-and-a-half miles, or on grassy parkways if your physical plant isn't that nice. Let them finish up before the crowd at the football field. Before Thanksgiving, some gangly kid who finished last and had to walk part of the time will come back to the stadium with your leaders, and possibly beat them.

Add a two-mile run to the high school track meets. Start and finish on the track, but head the boys for the grass for most of the run, even if the only grass facility is the run inside the circumference of the curb of the running track.

America has gone hog-wild on baseball. We have five, six or seven leagues-- Pony League, Little League, Big League, and all the others. The results are evident. How about a formalized plan, such as I am discussing, to develop distance running in the United States?

Now let's take a look at the college phase of the plan. I suggest that we spice up cross-country running in the fall. Use the same techniques as suggested in the previous "Nine-Year Plan" for the high schools. Get an interested coach or supervisor who will start the boys easy, keep their interest up and keep them off the running track. Consider visits of distance runners, lectures and movies; consider a few simple rewards, and consider starting and finishing these runs before a football crowd rather than having the kids running on Saturday morning five miles from the stadium.

Beyond these simple plans for colleges, can't we increase the distance of cross-country? Six miles of cross-country never hurt us as collegiate seventeen to nineteen year olds. They helped us. I understand that now your collegiate runs are three, four or five miles. This means that even your top boys come up to the National A.A.U. cross-country 10,000 meters and they are not in shape.

I suggest to you gentlemen of the National Collegiate Track Association that you get together and pull these distance runners back to six miles. If we stay at three, four and five miles, we are not going to develop these distance men who want to be developed.

Can we get a few more top boys over to the Continent-- possibly on an exchange student basis? It is possible that we might get enough help from Washington on this. The rules might be changed. A three to six month stay with some of our top American distance runners competing and working out and living, if possible, with the top distance runners on the Continent can cause fast and real progressive development.

You gentlemen, as coaches, promote meetings and are on the advisory boards. Give the runs over three miles-- 5,000 and 10,000 meters-- a regular and prominent spot on your programs. Many of you say, "Well, we have had to move that 5,000 meter run with forty entrants up to ten o'clock in the morning or run it after everybody has gone home at seven o'clock at night because they are going to slow up my finely conditioned track."

These boys will string out after one lap so they are in single file. All you need is a single-lane path. Use a one-lane roller to smooth your track and compress it after a 5,000 or 10,000 meter run, but give these hard-working athletes a chance to compete when the crowd is there in the stands.

Create regularity of runs above two miles at every track meet. Presently our distance men are not encouraged. They get four or five runs a season at most. They need more.

I believe that in the colleges and invitational leagues we have to plan on competition for the good runners. Ask any of the distance men, including some of the boys seated in this room right now, if they would rather have an easy run at 5,000 or 10,000 meters or place fourth or fifth to Albie Thomas and other top foreigners. I am sure that any of these distance men will say, "I would rather take my chances on running fourth, fifth or sixth to the top men."

So when you plan three to six mile runs, try to get them with competition, rather than one good man and ten, twelve or fifteen men who don't rate up with that one man. It is the only way the one good man and the other boys can improve.

Now, the final step concerns the clubs. All of the foregoing comments about spicing up distance running in college apply to clubs. They are the indispensable link between colleges and world recognition for the United States in the distance runs. Adequate maturity, conditioning and plain running knowledge will rarely be developed before graduation from college; the club is the answer.

Once again, the experienced man still has a lot to learn. High school, college, and three years of club running still may not develop a man completely on pace.

During the last year or two, there has been highly accelerated organization of small track clubs. If this acceleration continues, is nourished, and these track clubs survive, America will at least have a fighting chance to emerge from these "distance doldrums."

These clubs motivate boys to run after college. They are the major reason why the Continent, England, Australia and Finland have developed men who run 5,000 meters under fourteen minutes, and 10,000 meters in the low 29 minute range. We in America may never meet the planning perfection of some countries where these clubs are subsidized and prime distance candidates are relieved from financial pressures so they can devote the hours necessary for distance running. We should, however, plan to go ahead as far as we can within the framework of our present rules.

This foreign resurgence in distance running did not come about by chance but by thoughtful organization of clubs and administration of clubs, and America is still trailing a bad second in this regard.

Our Southern California Strider runners who recently returned from a trip to Europe tell me that top runners show up at every meet, country after country-- sometimes only two or three days apart-- obviously with no financial loss and no money expended from their own pockets. Thus they are able to get into competition with our men who they need to contact to remain in the World Class position.

In summary, these detailed suggestions which I have made regarding high school, college and club running all combine to motivate our boys to try distance running and provide us with a wide reservoir of sustained interest through high school, college and club days. All any distance runner needs-- because most of them have the personal desire and, several of them, a real, personal dedication-- is a little guidance, a little scheduling, a lot of interest and a pat on the back from an interested coach. They need a handful of other boys to provide companionship and competition in their workouts and races to make the sport fun, and America will begin to progress.

NEW HORIZONS IN HIGH SCHOOL DISTANCE RUNNING

By Archie San Romani, Sr.
with Archie San Romani, Jr.

Gentlemen: I want to thank you for inviting me here and giving me this great honor-- and also for honoring my son.

I am to talk on "New Horizons in High School Distance Running." I asked, "What do you want me to talk about?" The response was, "Talk about something you did in your early-day training, and then draw a comparison."

I believe my becoming a miler came about as an accident. When I was eight years old, I was run over by a Ford truck. Four doctors said, "Cut off his leg." Only one doctor said, "No, I think I can save that boy's leg." As you can see, I have my two legs today. But in the course of saving this leg, my right leg became badly withered and was very weak. The doctor said, "Arch, you have to run if you want to build that leg up." So I started running from the age of eight and nine and went on that way through high school.

My dad didn't believe too much in athletics. He thought a young boy should come home. The track coach lived between my house and the high school. He said, "Arch, I would like to have you come out for track." I didn't even know what he was talking about. But I did like to run.

In the first year, I beat all the boys in the mile run in high school. That is the only time I had a coach, in high school. He got me started. The only thing I knew about running was that if you wanted to run, you had to get out and run. I made sure I ran two miles every day. How much more than that I ran, I can't tell you. The neighbors all around the high school thought I was crazy because I ran so much.

The first year of college, I went to a small music school. I wasn't even going out for track. But the track season rolled around and, like an old fire horse, I went out for track. I think I went out three weeks before the track season was started. Luckily, there weren't too many good runners in the conference I was running in Lindberg, Kansas. In a dual meet, I won the mile, and twenty minutes later I came back and won the half mile.

On the way home, the man who was supposed to be the track coach said, "Archie, you are my one-man track team. I think a great deal of you. By the way, do you have any good football players in your home town?"

I said, "Yes, we have some."

He said, "Why don't you have them come around and see me? I will see if I can't get them a job."

I said, "Coach, I have to work, too."

He replied, "Well, we don't have anything for track men."

Well, I had to work my way through school. I was hearing a lot about a fellow by the name of Fran Welch, at the Kansas State Teachers College. I thought, "They have a big track team, but I am going to write to that fellow anyway." Well, I wrote to him, and I think my letter said:

> Dear Mr. Welch:
>
> I would like to enter your school. I will do my very best in my studies. I want to be on your track team. (This was in 1933-34.) I want to make the Olympic Team in 1936. My time is 4 minutes and 29 and 9 tenths seconds.

I sent that letter to Mr. Welch. I can imagine how he felt and what he thought of a man with that time trying to make the Olympic Team of 1936. He wrote back to me and said, "If you come here and work hard, I will see you have a roof over your head and something in your belly." That is just the way he put it. He gave me the break.

The only thing I knew was just to run. I had the poorest form of any runner who ever ran a mile in his life. Fran took me from a tight, laborous runner and brought my form to where it belonged. I had a stride of sever feet and seven inches in length. He said, "Arch, if you can get the stride shorter and get to running easier, you will be a fast runner."

He brought my stride down to six feet six inches. He lowered my time in the three years I was with him and he taught me relaxed running.

Fran's method of training in those days is not a lot different from the method we are using today. We didn't talk too much about it then. We had our intermittent sprints, our quarters, alternating quarters. Of course, they have shortened the distance. Run a quarter, walk a quarter; run a quarter, walk a quarter. I would like to run a 60-second quarter and then next a 62-second quarter. Then I walked. Now I understand that the boys will jog, but I think that the principle of the thing is still the same. I know that I got where Fran wanted me to get.

One thing I think is different in the way of running today than in my day--

we never worried about records. We went out to win a race. I don't know if it is our means of communication today or what it is, but now every time a boy goes to his marks, he is shooting for a record. In our day, we picked out the best boy in the meet and said, "That is the boy you have to beat." I think that accounts for our records tumbling as much as they do today. All I wonder about today is that sometimes they told me I worried too much. But I thoroughly enjoyed running.

I don't think a man can be a good distance runner unless he has his heart and soul in it-- unless he really enjoys it. As soon as a man comes to a point where he doesn't enjoy being a runner, I think he is done. I think he is burned out.

Regarding this idea of new horizons in high school track athletics, especially concerning the mile, I can remember reading (I think it was in 1934) of the first boy to run the mile in four minutes and twenty-one seconds. In 1937, we had a boy named Les Mitchell from New York City with a 4:18. He was the first boy to go under 4:30. Then the war came along and I noticed in track and field that our mile dropped, and around 1953 they were running in the mid-4:24's. They even had it up to 4:32. We had reverted back to 1934 in the high school record for the mile.

In the past few years, Dale Story ran the mile in 4:11. Then my son came in with a 4:10. Dale Story and he met, and again Dale ran a 4:11 and Arch came in at 4:08.9.

What is causing all this? For one thing, I think it is better coaching. We are getting young men in high school and out of college who are learning better methods of coaching and passing that knowledge on to our high school boys.

Another fine thing is this cross-country run. I don't think there is a greater conditioner for a high school or college athlete than the cross-country run. It puts a background on them and they are ready to start their polish work when they start track. Also, competition is different now. I didn't run as many races in my three years of competition as Archie does in one year of competition in high school. I think that helps to develop milers, too.

As for a new horizon in track, I don't think it is so ridiculous for us to say that a youngster in high school of eighteen years, or between eighteen and nineteen, is going to be running that four-minute mile. Consider Herb Elliot of Australia, for example. I think he was eighteen years and six months old when he ran 4:06.7. When he was eighteen years and eleven months, he ran 4:04.3. Boy, that is not too far away from the four-minute mile! That boy was of high school age at that time.

We have a lot of boys in high school nineteen years of age. I think the new horizon of track is going to be well under 4:10 and even, as I've said, close to four minutes. Now, Archie, Jr. would like to tell you about his training.

Mr. Archie San Romani, Jr:

As a third-grader, we used to have field days. The grade school kids would always say, "You are a fast runner because your Dad was a fast runner." Actually, I am really lucky because my father didn't push me. He didn't mention it until I was a sophomore, and that is when I started it.

But as a third-grader he told me how to get a fast start in a fifty-yard race. And when I got into seventh grade, I was a fairly fast sprinter and I loved track. Every year I would go out for three weeks, and I thought that was the track system. In the eighth grade, I wanted to go out and get my letter and be a real big intermediate. I couldn't run. I tried the broad jump and couldn't do that. I grew six inches that year, and Dad told me I wasn't too well co-ordinated.

In the summer of my ninth year, Dad asked me if I would like to be a miler. I said yes, and he started me out running three miles every other day. As time went on and high school was right around the corner, our first trial was a mile run across country. We went out-- and this is why I feel very fortunate again-- and the quality of boys in our high school was such that everyone liked to run and liked athletics, and that is what they were there for. We had eighty-five boys out for cross-country the first year. Some were swimmers, some were basketball players, but they were all out there to have fun, and I think that is half of athletics.

In cross-country we don't stress speed, because the weather in Kansas gets cold and you don't want to just go out and start sprinting. Ours is an over-distance strength program.

Our system in Kansas will not allow the coach to work with us, so usually five or six of us go out together and lift weights and work on parallel bars and get in a little cross-country. I found in my senior year that running in the snow helps on the track quite a bit.

In the spring we had 120 boys out for track, so the coach couldn't give a whole lot of personal attention to any one boy, but he worked with five or six of us. On a Monday, we worked down. We would run a mile, wait three or four minutes, run the half, quarter, 220 and 110. After that, we would go to the quarter. We had six or seven teams, which made it somewhat competitive, so we didn't notice when we were getting tired. We ran four sets of these, and after that would end up with four or five 110 sprints.

THE STEEPLECHASE

By Phil Coleman
Chicago Track Club

A recent issue of "Track and Field News" mentioned that the steeplechase is the easiest event in which Americans can make the Olympic team.

In the last decade, the United States has had only three good steeplechasers. One of them has retired, and he suggested that perhaps the other two were "over the hill."

Whether this is so or not, I certainly agree that the steeplechase is one of the "sort touches" in the American track picture, and certainly we don't need to look far to learn why.

In the first place, how many of you see steeplechase run regularly in large or small meets throughout the season? Not many of you. In the second place, how many of you who are coaches feel that you are qualified to tell the boy just what he is supposed to do in running steeplechase?

Again, there is just not much information available, even the most basic sort of information. The steeplechasers who have developed in the United States have developed on a hit-or-miss sort of system. They simply start trying to run a steeplechase and finally they struggle to the point where they run the event with a certain amount of proficiency.

Every year in the National AAU championships, we see a rather distressing thing. There will be twenty or twenty-five men in the steeplechase, and half of them have never run a steeplechase before. They come to the National AAU and they know they can't make the team or probably can't place in any event. So they say, "Why not try the steeplechase?" It is rather amusing to the spectators when this group of runners comes around the first time and up to a water jump. Suddenly the runners begin to ask themselves, "What am I doing in this race?" Many of them have never seen a water jump before, and here they are trying to struggle over it.

What I want to do here is simply outline the very basic essentials. I'd like to present a basic program to which I feel every coach should expose his distance runners so that this country can find what steeplechasing talent exists and develop that talent when it is found.

There are three basic abilities a distance runner has to acquire in order to become a steeplechaser-- granted that he has a certain amount of distance-running ability.

The first of these is the ability to hurdle. Second is the ability to take the water jump, and the third, which is a little less obvious but probably the most important of the three, is the ability to continue to run in good form and at a good pace while taking the hurdles and taking the water jumps.

Let's take these abilities one at a time. Hurdling ability is basically a matter of learning to take the hurdle in stride, leading with either leg, learning to take it without flying too high in the air going over the hurdle and doing it in a relaxed manner.

The two important fundamentals of steeple hurdling are: (a) lead leg snap down, and (b) relaxed trail leg action that doesn't have any hitch as it comes forward over the hurdle.

The water jump is a bit of a problem because in order to take it correctly the runner must speed up. It has to be the fastest part of the race. The runner has to have confidence that he is going to get to the water jump on the right stride. Only hours of practice over the jump can give this confidence. If he has the same problem I have, he has to get there on the same stride, leading with the same leg. This means putting down marks. I put my marks 69 feet from the hurdle, which happens to be eleven strides from the hurdle for me, and another mark eighteen feet, which is two strides from the barrier. Then, coming into the hurdle, I hit both of these strides with my left leg. I am accelerating between the two marks. I can take the water jump landing on one leg in about ten feet out and eight inches of water, and my running stride carries me right through the water jump. I get one foot wet; not that the wet foot is any problem, but this is a sign that I am continuing momentum and clearing the jump with adequate speed.

The most difficult thing to learn, especially if you don't have any systematic training facilities, is to run with proper distance form between the hurdles. Every barrier slows you down to a certain extent, and the problem is to accelerate quickly without working too hard at it the first couple of strides after the barrier, and then to run relaxed but efficiently while looking for the next barrier. This takes a great deal of practice, and I would like to talk a little about how this can be done.

It seems to me that it would be very normal and very natural for every coach to start his cross-country team in the fall by introducing his runners to these three techniques which are required in running the steeplechase. We have talked about adding variety to the program-- making practice interesting. Here is another way it can be done to give the runner a little variety in his training and to introduce him to these new techniques at the same time.

The time to start would be early in the fall after the boys have acquired

some basic conditioning. Simply use them as the warm-up period of two practice sessions a week, or if you run your boys hard only every other day, perhaps the days when you are not running them hard would be the time. Start by teaching the boys how to hurdle. These boys are probably going to have to be taught the very basic things. Most of them will not have taken a hurdle ever.

I think the place to start is over a low hurdle. The most important thing to teach a steeplechaser in the beginning is to hurdle with either leg. He just must learn to hurdle as naturally with his left leg as with his right. This is most important because in a race where the hurdles are at different distances apart-- let's face it, the rules say they are supposed to be a certain length apart-- the way the tracks are, they often are not. Barriers are just set out on the track. Nobody goes to that trouble; in a race where runners get as tired as they do in steeplechase, no one is going to count his steps and hit every hurdle regularly. Perhaps even if he did hit his hurdles regularly, it would be too tiring to take all the barriers with the same leg leading all the time.

Remember that the two essentials of steeplechase hurdling are the quick snap-down of the lead leg and a relaxed trail leg action that doesn't tire the runner. If you emphasize a quick snap-down, for one thing, he won't fly over the hurdle too high.

If it takes a month of the cross-country season working two days a week to introduce the entire cross-country team to the running techniques of hurdling with either leg, it will be worth it if you have one boy who learns the techniques and becomes proficient at steeplechase.

The next thing to teach the boy is the water jumping technique. Here is the big barrier. How many schools are willing to build a water jump (a big water hole), especially in the football field? They will never do that in the fall. You simply cannot get this done, but you don't need a barrier of this sort. The thing to do is to get some good 4 by 4's or even 2 by 4's and build a small, portable barrier. I have one of these down at the University of Illinois. It cost the University about five dollars worth of labor to build it. It is light enough so I can carry it around and still it won't move when I set it on the track because the braces are built in a triangular fashion. It is as solid as any barrier in the ground. It is about five feet wide and one man can practice on it at a time. I carry this barrier out onto the grass and I do my practice over the water barrier on the grass, with no hole on the other side. I simply practice the approach and the jump, trying to land out ten feet from the barrier and emphasizing strides that would get me out of the water (if there were water there) in one step.

Now, here is where most people are reluctant. They are afraid that they might injure a key runner at a key time of year by having him practice something ridiculous like this. If you do this in the fall on the grass, with no

hole on the other side, you won't injure anyone. If a boy should get a sore leg, just tell him to lay off of running the barrier for a week, and any injury he gets will clear up.

In introducing a new runner to the barrier, the important thing is to find the spot out about sixteen to eighteen feet where his second step before the water barrier will be. Then find the boy a mark further back which will bring him into this close mark on the desired foot. Then, hitting this spot, he will take two steps and take off.

There is no half way in taking the water jump. You must run into it at better than 70-second quarter pace. The runner should try to make this the fastest part of the race, as I have mentioned, and he has to practice it at race speed.

Another thing to emphasize in teaching the water jump is a one foot landing. Any time a boy takes a water barrier and comes down with both feet, all forward progress stops. It also places great strain on the legs. A runner who is tired and takes this jar slows down for good.

The important thing is to emphasize with the one-leg landing that the runner must have a fast take-off. This is easier to teach and learn, by the way, than hurdling.

If the boy learns these two techniques during the cross-country season, he has made a great deal of progress. He has learned something about steeplechasing that the vast majority of people who compete in the steeplechase have not learned.

The third phase of teaching is the technique of running between the hurdles. Boys must not let hurdling and water jumping upset their rhythm. It seems to me that the practice that is needed to acquire this ability could add a little variety to the cross-country program.

A boy who has talent for hurdling and water jumping could well spend one day a week through the winter and spring running repeat quarters over five hurdles. Forget about the water barrier. This takes a different ability that he practices when he is fresh and not while running repeat quarters.

Have the boy practice running a quarter in 70 seconds, jogging a quarter, running another quarter in 70 seconds. This may be a little fast at first. He needs to learn to take these hurdles at a 70-second pace. If he has to start at running them 73 or 75, that is fine, but a norm of around 70 is what you should aim for. Any time you have a boy who can run ten 70-second quarters over these five barriers, then you have made progress, and he should be put on repeat half miles.

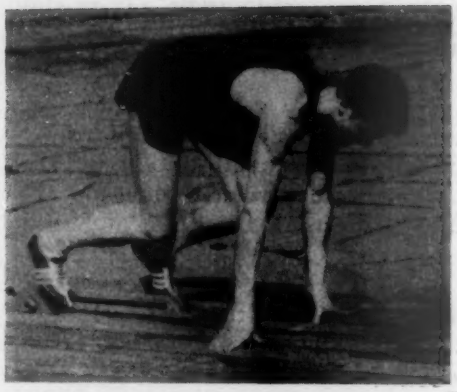
When the boy has learned to run five repeat half miles in 20 minutes, taking a three to five minute rest between each half mile, then I think he is ready to run a good, sound steeplechase race.

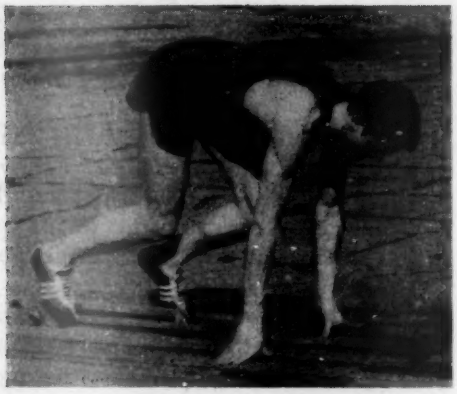
I would suggest that all your practice hurdling be done over standard hurdles instead of barriers. They are set at intermediate hurdle height and if he runs into one, he will just knock it over. Later, he may want to develop confidence by hurdling the water barrier and have something solid that he has to get over, but this isn't too important early.

The important thing for him to do is work once a week throughout the season-- repeat quarters or halves over hurdles. If he does that, he will be getting more steeplechase training than any steeplechaser in American has ever received. This includes Horace Aschenfelter, who trained over the hurdles a great deal when he was getting ready for an important race (especially in 1952), but who, in his normal series of workouts, did very little hurdling.

Most of us make the mistake of waiting until three weeks before the National meets and then saying, "Well, I have to get ready for the steeplechase, and I am going out and put in one hard week of hurdling and getting good and sore all over." Hurdling is an action which is not at all compatible with distance running. You use the legs differently, and it makes them extremely sore. You can go out and work for three weeks on hurdling and still not be ready for the race.

A boy who has worked out once a week all winter and all spring running repeat quarters and repeat halves at the 70-second pace-- I guarantee he would place in the NCAA and probably place in the National AAU.





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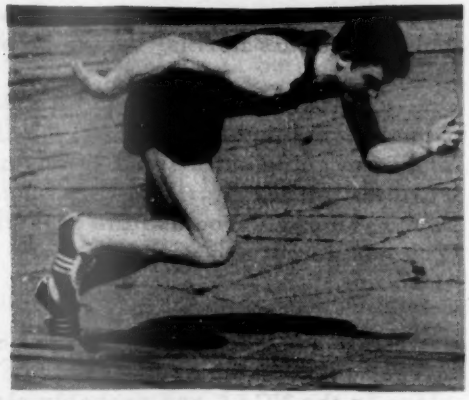


THE FOUR-HUNDRED METER HURDLES

By: Larry Snyder
Ohio State University

Gentlemen, it is a pleasure, of course, to be here. I want to welcome our guests from foreign lands. I appreciate their interest in track and hope that we will be able to give them something in our two days here that they will be able to take home and use in helping a lot of their boys.

The quarter-mile hurdles has been covered beautifully in past clinics, and you all have the '56 notes in which Lou Montgomery has given the finest dissertation on 400 meter hurdles that you could possibly find anywhere. He quotes from the available literature on the subject and he does a beautiful job. He has Charlie's splits for one of the races that he ran, so it gives you a good idea in starting a man to enable you to know how fast a man should be running to get to the first hurdle, and how fast he should be running between hurdles. To keep him running that fast is a job that we have to do.

In addition to that, in the 1956 Digest, Tom Botts made a fine presentation. He wrote about his boy Dick Ault. Dick was a big fine strong hurdler whom I was fortunate enough to be with for seven or eight weeks over in Europe in the summer of 1949 and he exemplifies the type of boy who you must have, I believe, to be a fine 400 meter hurdler. A big boy, strong and as loose as possible, a boy with a good fighting heart. When you get a boy like that, of course, you have a very good one.

I jotted some figures down to remind you of the distances to the first hurdle, 45 meters, which amounts to 49 yards. You have nine yards more than you would have for two low hurdles.

The distance between your hurdles, 35 meters, is 38 yards and a foot. You let the boy worry about how he is going to get in from the last hurdle.

How that works out in strides, say, for your Dick Ault type, for your Glen Davis type or for your Charlie Moore type is 22 strides taken from the starting line to the first hurdle.

You are going to find some boys who must take 23 strides. I would guess that Josh Culbreath probably takes another stride to get into that distance because he is smaller than Davis, Southern and others.

To get that extra stride, of course, the man's feet would have to be changed at the start. You wouldn't have the low hurdle start any more. He would have to reverse

his feet to let him pick up an extra stride or to cut off a stride, if you wanted him to run it in one less stride. Concerning the strides between the hurdles, I would say that we should very definitely think in terms of 15 strides, rather than of 13 strides, which Lou Montgomery presents as the method Charlie Moore used.

Charlie Moore ran everything from the 100 up through the 600, and he ran all those distances well. He won many of the 600 yard races in New York, and in the dual meets, he would run the 100, 200 and the low and high hurdles and on the mile relays team.

His father said that he had the strongest legs of any runner in the world, and he convinced Charlie of that and it showed in Charlie's running, no doubt, so 13 strides was his goal.

He got so that he could run the entire distance with 13 strides between the hurdles. That means that in the overall race he had to average seven and a half feet per stride. Now that is a pretty big stride. When you figure that his first stride is perhaps two feet long at the most and the next one a little less than three feet, he has to have tremendous strides all the way in order to run it in 13. I never felt 13 strides was right for Moore, but he won the Olympics. Charlie won, and won very handily, at Helsinki, running in the outside lane which I don't believe is a handicap to a fairly experienced runner. I think then he runs his own race when he is in the outside lane. He sees no one till he comes off the last curve and he runs his race the way he should run it; but Charlie won very easily over there, set a new Olympic record and then we went to London for a meet immediately after the games in Helsinki.

It was a beautiful day in London, a rarity, a fine track, solid, hard. Charlie ran 13 strides all the way. I don't remember the exact time, but let's say :51.8, maybe it was :51.2, I don't know, but he ran what looked to be a smooth race. Charlie always gave me the impression that he was over-striding. Well, the boys went out to different places, Germany, Vienna and here and there, and ran once or twice through the week and came back to London the following Saturday for a meet. It was pouring rain, the track was soft and the track was muddy and slippery. Charlie drew a middle lane this time, he knows that he can't run 13 strides because of the mud so he ran 15 strides the whole way and ran better than a half a second faster than he had run with 13 strides on a firm track in beautiful weather a week before.

So I know that that convinced me. I was convinced before but that was the clincher that 15 strides was the number that we should try to train a boy for rather than 13 strides.

Figure this out with 22 strides to the first hurdle, then there would be 135 strides between the 10 hurdles, 18 strides in from the last hurdle. Ten strides as we would call them averaging about 10 feet over the hurdles, so the boy is actually taking 184 strides during this race; and if you can get a boy that wouldn't vary from that, I

think you would have a dandy, because if he can run the 15 all the way you know that you have a strong boy.

There have been a lot of fine hurdlers who couldn't do it.

Now in the International Digest for a :50.8 race Monty gives the times and I will just go through them to give you the splits :06.2 in both the preliminary and the final, he ran :06.2 with his crotch over the hurdle, that is the 49 yards and two feet, he went :06.2 seconds. Then it was :10.3, but I'll jump now to the interval between the hurdles. :04.1 was the interval between the first and second, four and one, four and two, four and three, four and three, four and six, the rest of the way. Then :05.4 in from the last hurdle.

As I told some of the boys at breakfast this morning, I was going to do a tremendous amount of research this spring on Glen Davis because he is strong, he holds the record and it would be a wonderful thing if you could tell just exactly how Glen Davis does it. I can't, I am sorry to say, give you much information because, as you will find out, it is difficult to get a boy to work on the 400 meter hurdles the way you plan and you would like to have him work because it is a tough distance on which to operate.

If you want to practice starts on a certain day and you want to practice and combine work to the first hurdle along with it, that means the boy has to run a 60 yard dash every time he takes that practice start. If you want to work him over 3 hurdles including the start he is going to go 135 yards every time. You soon find that you can't repeat that too much and too frequently, particularly when you combine that with a sore back or a sore knee or the fact that you want him to practice passing the relay baton with the other boys. You will find that all the plans that you made for this boy won't work because the boy who is going to be able to run the 400 meters well is going to be one of the best boys on your track team. Probably he is going to be the best in at least a group of five or six events. You are not going to take everything out of him in practice in order to have him ready for a couple of meets at the end of the year. You are going to be thinking about those three, four or five events that he can be in in your dual meets, your triangulars and the rest of the big relay games.

So all these plans just went out the window. The thing that I am convinced of is that the pace going out toward the first hurdle should be about the way a man would run a 49 second quarter and I think we should work to get the number of strides to that first hurdle so that that man is accelerating toward the hurdle just the way he would be going to if he was going to run a 49 second quarter mile.

Glen, on many occasions, and Charlie Moore, on many occasions, has reached out and reached the hurdle in 20 or 21 strides. The smoothest way has always been 22 strides. When Glen gets there in 22 strides, then he goes automatically into a 15 stride race; but if he is stretching to get to that first hurdle, then he automatically

goes into the 13 strides and trouble. He gets up there about 10 yards in front of the third or fourth hurdle and boom, he realizes that he is not going to make it in 13 strides. So a big chop in there and he gets over, but he has lost many yards as he drops to 15 strides.

So often it happens in practice when you are practicing over 3 hurdles that the boy runs too fast and he stretches too much. He runs it as if it were a 220 yard hurdle race instead of a quarter mile race in which he is going to try to use a quarter mile stride.

I think that is the goal to reach for, to make the boy run as nearly as possible the way he would run a quarter of a mile.

Now Glen, as strong as he is, when he uses this 22, then he has to think, when he clears that hurdle, of chopping just a little bit to get the 15 strides. If he stretches he can make it in 13 but if he thinks about it and immediately chops just a little bit, three or four inches off of each stride, then he gets there very nicely in 15. I am looking forward to the day when somebody can run :48 flat in that race.

The first question that I was asked in Poland last summer was, "What doesn't Davis run it in:48.5?"

Frankly, I didn't know the answer. I said, "Well, he just runs against the other boys, he doesn't care about time and all this and that, he just runs to win."

But I don't think that is true at all; I think it is because we haven't worked out this smoothness, the way he runs the 400 meter or the 440 yard run, and when we do that, the man of the Charlie Moore type and the Davis type, and a lot of the up and coming boys will take that record down to:48.5, and then lower than that.

There is no reason in the world why a man who can run :45.5 for 400 meters shouldn't run :48.5 or better for the 400 meter hurdles. We only figure about two tenths of a second, I think, for hurdle clearance in any of the other hurdle races. There is no reason why if we get the smoothness that we should get and the type of boy that we know can run this in :45.5 for the flat race. It's certain, then, that 400 meter hurdle race is going to come down, down, down.

How many hurdles, or, what is the maximum number of hurdles that a man should run in practice? Well, we have tried all the distances and I have come to this conclusion; that a man should never attempt to run the full race in practice even though you have a pacer out there in front of him. The incentive is not there and the boy just messes up the last three or four hurdles.

I would say never run more than seven hurdles in practice, and probably five or six is even better. He can do that and when Glen was at his best a couple of years ago

he was running three of those hurdles; three five-hurdle races, or two with seven hurdles. And that running seven hurdles means, of course, that he also runs another 15 or 20 yards because you never let a boy clear a hurdle and ease up.

I think I have hit most of the points that I had planned to. I didn't give you Glen's times in working over three hurdles. His normal time of the first hurdle is :05.8. That may be a little bit fast, see, Charlie in running that:50.8 was :06.2 for the first hurdle then Charlie showed down to :04.6 toward the end of the race between hurdles. Glen never gets down that far. I think :04.4 is as high as I have ever timed him between hurdles in one of his races, and the time to the first hurdle has varied considerably; but I would say :05.8 to that first hurdle, which is about a second more, which would amount to about eleven second hundred actually, is a good standard time for him. I time that as when the foot hits over the hurdle. Monty timed when the man was directly over and it was easier for me to time when the foot hits over the hurdle, that is the way my time has been taken. Glen's time has been as low as four seconds and some as low as :03.9. Now whether that was a fault of my timing I don't know, but if a man would run :05.8 to the first hurdle and then average :04.4 between hurdles, come in in :05.1 from the last hurdle on in, then he would have a :50.5 seconds race.

That might be just a figure for you to think about. I would say that you could change it from :05.8 to :06.1 to the first hurdle and try to average :04.4 between the hurdles and then, or course, the faster the man can come in, the faster his race is going to be. But Glen, for the most part, has been with the field for seven hurdles. He has never been in the lead. He has always been, in fact, on many occasions when he would draw the outside lane, and he knew there was a good man inside of him , he would let that man pull up beside of him and then run with him. Then, with three hurdles to go, would really pour it on and barrel in there just as fast as he possibly could.

I mentioned the stride. I mention it again. The average stride length including the hurdle clearance is seven feet five inches. That means that you absorb the 10 feet over the hurdle and the short ones and you come out with a 7'5", which would be the average length of the man's stride and the average length of his stride, excluding the hurdle clearance, would be seven feet. This is on the 15 stride basis between the hurdles that we talked about.

I just took a guess at that ten feet for hurdle clearance but I would say it is somewhere near that. I could go to eleven and for some boys that chop down it might be less than that. Chopping down is where your boy can learn a great deal if he knows that to get 15 strides he has to reach, then he wants to ride over the hurdle as far as he can ride, if he knows that for 15 strides he is going to have to shorten his stride, why then he chops down as quickly as he can over the hurdle.

I don't think it is as tough a race as we have made it out to be. As long as the competition is there, the kids will run it. I don't think it is as tough as a two-mile. I don't think as tough as a three-mile, I think the longer you go, the tougher it becomes

at the speeds we are running them now.

In the old days that wouldn't be true but the boys who have the courage and who have hurdling ability are dominating things today. I would say that you are never going to have a quarter-mile hurdler unless he has hurdling ability. Your best 400 meter hurdlers are going to come from your hurdle group rather than from your quarter-mile group. You can help that situation, of course, by having hurdles set around your outside lane at 20 yard intervals or forty yard intervals and what not, let the kids, after they become partially warmed up, run out there and take those hurdles as they go around in completing their warmup.

I might mention this; that you can't start practicing quarter-mile hurdlers as part of the warmup, that is, when you are working towards stride. That man has got to be warmed up just as much as if he were going into a race, otherwise he is just wasting the time. Because his strides aren't going to come out and you stand there and you fire the gun and you count the strides and everything, and each time it is something different.

So be sure that man is well warmed up, just as if he were going into a race before you set him off.

THE NOVICE 440 METER HURDLER

By: Joe Healey
New York University

I remember one race I was in years ago. It was in Yankee Stadium when they had the first hurdle hidden around in back of home plate so that I had to draw a line out on the track, a distance that I knew well, and running for my first hurdle I ran to that line and made sure I hit it with a predetermined foot which carried me over the hurdle with the right stride.

I think with the novice hurdler you have to depend on some gimmick like that to keep them from losing momentum when coming up to the hurdle in the 440 hurdle races.

I would suggest that you put hurdles on the track at various distances, anywhere from 30 to 40 yards in order to make a boy more confident in judging a hurdle from the point away from the hurdle, so that if he is 20 or 15 yards from the hurdle he can make any necessary adjustments to carry himself over that hurdle with the correct stride without losing momentum.

As you know, in the quarter-mile hurdles you will see a field go along very nicely and then one fellow will balk coming into the hurdle and he will be completely out of the race. He simply had never practiced adjusting to emergencies.

In the quarter-mile hurdles I think a man has to mind his own business. Running the quarter-mile in the lane more than they did years ago teaches the boy to carry on himself without depending on race strategy such as they do out of the chutes or around the turns without lanes.

Now the quarter-mile hurdler has to mind his own business or he is going to get in trouble. A man like Davis, with his ability, can wait a little while for the man to catch up and then go along with him and run right off the track; but your novice hurdler or your inferior hurdler is going to have a lot of trouble if he tries to run in the field with the field. I think the best bet is for that boy to get his own confidence and run his own race.

There is one gimmick that I tried years ago, and I try to tell my kids now, that it is just as important some times to practice the last three hurdles as it is the first three. Well, that kind of stuns the kids, and they want to know how are you going to practice the last three before you run the first seven.

We used to set up three hurdles and go over them at the start of the race, slow down and continue around the track, come back to those three hurdles, and having hit a point in front of this so-called seventh hurdle now, the boy would pick it up and carry it over the last three as though he was running the last three of the race.

Fatigue would have set in, so that the three foot hurdles, as Larry said, would increase in size and the tenth hurdle would be a five foot barrier.

That is what we want to have the boys practice on.

After this very fine coverage that Larry gave you, I can't think of any more to add to it but I am sure that you men have a few questions that Larry and I can take a shot at.

Bud Winter: Larry, would you put up Glen Davis's weekly schedule? What he does in addition to hurdling?

Mr. Snyder: Well, Bud, if I give you one week's schedule it would be just one week's schedule. It would have no relation to any other week during the program, because Glen has been, as you know, in all different events. Oftentimes during his regular season he would run in as many as seven events per meet. So he would do nothing until Tuesday, and oftentimes until Wednesday, of the following week, and if he did it was just the easiest of jogging and loosening up, a few calisthenics, and then this past year he had a bad back so that he couldn't hurdle until about three and a half weeks ago. The first hurdling he did since the start of the winter.

If he works 150 yards he will work six of them as hard as he can run, just walking back to the starting line, go into it with a running start then takes an interval of about twenty minutes, and then he will run six more of those. So he gets a fast workout, he gets the repetition which most of us feel is good and then he gets that little rest interval in between the two sets of them.

I have always been prone to use distances like 300 yards for quarter-milers, low hurdlers and people in that category, so that we will run two real good three hundreds sometime during the week. Last week before Glen got licked out in California, on Wednesday, he ran 320 yards from a running start in:33.1, came right back and ran a 300 in :30. I don't mean right back. In about seventeen minutes he came back and ran :30.3 for the 300 with a running start. Now that was his workout for the day except for the running that I don't think we ever consider, all of the additional running that a boy does in getting ready to run something. In between they will run three, four or five miles, probably, and that we don't count that in their workout. If he would run as many as five hurdles, then he would run them three times with a little more rest in between.

When he ran the seven hurdles he never ran more than two of those in any one

day. That, plus his other work, seemed to bring him along real well.

Any other questions?

Question: What do you attempt to catch Glen at his 220 mark while going into the 440?

Mr. Synder: I have never been able to catch him at 220 mark because in the races with the staggered start I never know where the 220 is. As I mentioned earlier, Glen runs the field for about the first 300 yards. I would say he varies five to six or even seven tenths of a second in his first 220 in various races but I have never, in the Olympic games or for final tryouts, been able to catch it because, as I said, I can't guess at the 220 in the given lane.

Question: If the medium hurdles should be substituted for the lows and be a part of our dual meet program, is there any suggestion where they should come in the order of events?

Mr. Snyder: Not to my knowledge. I don't want to quote the Big 10, but we have the indoor meets where we run the 70 yard low hurdle race, and we moved that away from the next to the last event and moved it away from the relay; we put the two-mile now just in front of the relay so that we could bring our low hurdlers back as mile relay men. I think that would be a nice innovation for outdoor work because we could get a boy to run the highs and we could get him to run the lows, and now he can't run the relay. That quarter would do him more good than anything that could happen if we would just space it a little farther away so that he could come back and run the mile relay.

Do any of you have suggestions as to where it should be placed?

Mr. Ross: If you are going to put it in the dual meet program and move your high hurdles up to about the middle of your program, then you would have the boys ready to come back and run the mile relay, it would serve the same purpose in a dual meet as it serves in the National Championships, inasmuch as you would get the intermediate hurdlers on the track, have the race run and with the hurdles off and you could concentrate on the regular order of events.

Mr. Snyder: Well, do you think that the coaches would like to run their hurdlers in a quarter-mile hurdle race and bring them back in the high hurdles after that?

Mr. Ross: I think that the philosphy of the quarter-mile race has changed. I think that the boys look upon the 440 hurdles in the same way they look on the 220 yards because the 440 hurdles,(I ran them myself, I know), well, I enjoyed running the 440 hurdles much more than the 220 lows. I think anybody who has ever run the quarter-mile hurdles will admit that the quarter-mile hurdles are more rhythmical and the pres-

sure of the intervals is less than that of the 220 yards.

Mr. Synder: Of course, the 220 yards is a speed race, if a man doesn't have sprint speed these days, a man is going nowhere in the low hurdles; but by the same token, if a man doesn't have both speed and strength he is going to go nowhere in the quarter-mile hurdles either.

Mr. Ross: The thing you can build, Larry, is strength. Much more so than you can speed.

Mr. Snyder: What do you think, Joe? You have run them.

Mr. Healey: Well, as far as the position of the hurdle in the race, as Larry said, I wouldn't want to run a good hurdler over the quarter-mile hurdles and come back and run a good flight of highs. As far as convenience is concerned, of course, the best thing to do is to have it number one, set up your hurdles before the meet starts. Have the hurdles all ready before the meet starts, get your quarter-mile hurdles out of the way. But I think you will have to depend on two different individuals or several different individuals running the hurdles in that kind of a schedule.

Mr. Snyder: I think you expressed it, Joe, when you said as far as dual meets are concerned, if you get it out of the way.

I feel the same way about the 400 meter hurdles in dual meets as I would about a six mile. I would be glad to get it out of the way.

I don't think it would add a darned thing.

Does anybody else have any questions pertaining to the race? If not, well, thank you gentlemen, it has been a pleasure to be with you.

THE 400 METER HURDLES

By: Eddie Hurt
Morgan State
With: Josh Culbreath

Gentlemen, Josh and I are very happy to be here this morning. We shall tell you what we know, or what we don't know, about how to run the 400 meter hurdles.

I hope to outline the problems involved in teaching the 400 meter hurdles. I will give you our suggestions on how to solve these problems, after which Josh Culbreath, champion hurdler, will come on to tell you exactly how he does it.

We would appreciate any questions you might have, because he can then discuss the various points that you want him to discuss. When you have your questions ready, I suggest that if you have easy questions, you submit them to me, and for the more difficult ones, Josh is ready. I shall attempt to outline six basic problems in 400 meter hurdling.

First is the problem of finding the right man for this event.

Second is the start of the race which includes everything from the blocks to the first hurdle.

Third is hurdle clearance which includes many factors: the distance of the take-off and the landing; the lead leg, whether it should be the right leg or the left leg; the action of the lead leg and the trail leg; the body lean into the hurdle.

Fourth is the matter of steps -- how many steps should be taken from the start to the first hurdle and in between the hurdles; how long these strides should be, and so forth.

Fifth is the matter of pace.

Sixth is training procedures.

In this brief discussion of the 400 meter hurdles, we shall attempt to outline some of the techniques that we have found to be successful.

It is a rather common belief that "good track men are born and not made". If this is true, about all that we as coaches can hope to do is to contribute all that we can to the fullest development of those potentialities that are already present. The major

part of this discussion, therefore, will be to illustrate methods which the coach can make his best contribution.

The 400 meter hurdles is one of the toughest events in the entire track and field program. The men who do not like to work hard and who are not willing to make every sacrifice in order to improve themselves should not try the 400 meter hurdles.

It should be noted that all of the good 400 meter hurdlers are also good quarter milers. You will find they can run the quarter mile approximately 4 seconds faster than they can run the 400 meter hurdles.

These men who run around 50 or 49 seconds must be able to run the flat race, the quarter mile, in the low 46's or the high 45's. If you will check the best time made by these hurdlers, you will find each man has run the quarter in almost exactly 4 seconds faster than he runs the hurdle race.

The factors that go into making a good 400 meter hurdler are: determination, willingness to work hard and willingness to make every sacrifice and have ability to run a very good quarter mile, and some hurdling potential.

This event also requires that the individual should have some height. Josh has everything except the height but he has more of the other things than most hurdlers have.

The trouble with a short man is he will have to use a modified high hurdling form in order to clear the hurdle.

In view of the previous discussion, we shall now consider the various techniques and skills involved in the running of the 400 meter hurdles. These fundamentals will include the start, the hurdle clearance, the steps, the pace and training procedures.

The Start: The start of the race varies very little from that of the sprinters. The first stride should be a little longer so that the runner may reach his normal running angle sooner than the sprinter and so that he may attain his desired running stride as quickly as possible in the race. At the start, the runner should be encouraged to sprint to the first hurdle, then reaching the pace that he plans to maintain throughout the race.

Hurdle Clearance: The take-off should be approximately seven feet in front of the hurdle, and the landing should be about four feet beyond it. Care must be taken that the hurdler does not get too close to the hurdle on this take-off step. If he is too close, the angle of ascent will be so great that he will be forced to high jump. The take-off should be far enough away so that the top of the trajectory will come before rather than after the hurdle is reached.

The long take-off will cause the runner to reach for the hurdle, thereby giving time for the take-off leg to become fully extended. When the thrusting leg becomes fully extended, the angle that it forms with the ground will be lessened. The smaller the angle, the more effective is the force applied by the thrusting foot.

While a body is in the air, it will lose speed rather than gain it. The lesser angle of take-off will enable the runner to get back on the ground sooner than will a larger angle. As the lead leg goes up, the trunk comes down, thus lowering the center of gravity of the runner and causing him to have minimal clearance. As the lead leg clears the hurdle, it is brought back to the ground by raising the trunk and dropping the leg. This action will raise the center of gravity and enable the runner to bring the trail leg through with greater ease. This action will also cause the runner to land with his weight ahead of his lead foot. The trail leg may be brought through more effectively by turning the toe outward and raising the knee as high as possible under the armpit. The arms should maintain their normal running action. We try not to change the action of the arms as used in running any more than we have to. It is a fact, though, that some of the shorter men have to use a modified high hurdling action of the arms in order to maintain balance.

Since this race is always run around one or two turns, the runner who leads with the left or inside foot has an advantage over the hurdler who leads with the right or outside foot. It will be noted that almost every high hurdler who has attained top times has led with the left foot. Liteiyev, Julin, Klenin, Davis, Howard, Culbreath and Potgieter have all led with their left feet. I think, with the exception of Southern and Moore, who led with their right feet, most of them use the left foot.

In running the turn, the hurdler should lean to the inside in order to overcome centrifugal force which is trying to pull him off course. The body has a tendency to go off-balance toward the side of the lead leg. This tendency will make it very difficult for the hurdler who leads with his right foot to lean to the inside.

The man who is naturally right-footed and who leads with his right foot will have an advantage on the straightaway because he has formed the habit of leading with his right foot and pushing off with his left foot. We do not recommend, however, that you teach a boy to lead with his right foot. If you have a beginner, we recommend very highly that you start him out leading with his left foot.

We recommend also that you aim the left foot about six inches from the inside of the hurdle. The right-footed hurdler should aim his foot at about the middle of the hurdle.

Steps: The hurdler should be trained to sprint to the first hurdle and try to gain the desired speed and stride as soon as he can. He should cover the 45 meters to the first hurdle in 19 to 21 steps. Josh uses 21 all the time and goes over on 22. He starts with his left foot back and right foot forward. He hits the take-off spot with

his right foot seven feet in front of the hurdle and hurdles with his left foot on the 22nd stride.

It may be necessary to change the feet on the block in order to solve this problem. That is, if he is accustomed to putting the left foot back and right foot forward, you may have to change that. You have to realize, however, that he will start more effectively if the dominant foot is the foot he uses on the block.

He should cover the 35 meters between hurdles in 15 steps. Although a tall man can cover this distance in 13 steps (Moore did), it is not recommended. The use of 13 steps will cause the hurdler to overstride. When a hurdler overstrides, his feet have a tendency to land ahead of his body weight, thus causing deceleration. Thirteen steps require that the runner should have an average stride of 8 feet 2 1/2 inches; whereas 15 steps only requires that he must have an average stride of 6 feet, eleven inches. In a race in which endurance is an important factor, it is believed that 15 short strides may be taken with greater ease than 13 long strides.

The matter of endurance is so important in this race that even the men who take 15 steps oftentimes find it advisable to go to 17 steps at the 8th, 9th and 10th hurdles. Care should be taken to avoid using alternate feet in clearing the hurdles. It is true that some men have had moderate success in alternating feet. However, it is notable that only a very few have become top-flight hurdlers. We do not recommend that you try to teach that.

Pace: As previously stated, the hurdler should sprint to the first hurdle in order to gain the desired speed as quickly as possible. Once this speed is attained, he should try to maintain it throughout the race. Physiologists and physicists tell us that it is easier to run a race with an even pace than it is with an uneven pace. They base their conclusion on the premise that a given amount of energy spread evenly will produce a better result than the same amount of energy spread unevenly. They argue that once speed is attained, it is easier to maintain it than it is to lose it and then try to regain it. It is obvious that one will get more mileage from a gallon of gas while driving at an even rate than he will at an uneven rate. However, although you try to run an even pace all the way, you will find most of the champions try to run the first part of their race faster than the later part. Josh tries to be on the ground over the 6th hurdle, which is 220 meters from the start, in 27 seconds. He tries to cover the last 180 meters over four hurdles in 23.5. This pace over the last part of the race is about 1.5 seconds slower than the rate over the first part of the race. After the hurdler has cleared the 10th hurdle, he should be trained to sprint to the finish line. He becomes a dash man as soon as he clears the last hurdle.

Training Procedures: In order to perfect these very difficult skills, there must be constant drill. The runner must sprint to the first hurdle until he can step in the same tracks each time. I think this is very important. When his steps are perfected, he will not hesitate to sprint to the hurdle because he knows that his steps

will be accurate.

By constantly running over a few hurdles, the length of his strides will become a habit. The hurdler must be trained to use the same length of stride, regardless of the rate of speed at which he is moving. That is, he must be able to accelerate or decelerate or keep the same stride.

Many races are lost because, in trying to accelerate, the runner lengthens the stride and he finds himself too close to the hurdle.

As soon as the hurdle is cleared, the runner should focus his eyes at the top of the next hurdle. The hurdler must be trained to concentrate on his own race rather than watching his opponents.

The 400 meter hurdler must be in top physical condition, which can only be attained by a series of strenuous exercises and a very tough daily work program. The following is a training schedule used by Josh Culbreath the week before one of his big races: On Monday, he ran 660, just flat; no hurdles involved. He came back with a 300 yard run in the time of:32.5 seconds. Then he ran over this first hurdle. He did that five times, just from the block over the first hurdle. He repeated that five times with about three to five minute intervals between these races, each time walking back to see whether or not he is stepping in the same tracks each time.

On Tuesday, he took a few starts - - about five. He ran 330 yards between:34 and:35 seconds. He ran over five hurdles, repeated five times.

Wednesday: Three to five starts, 300 yards, :31.7 to:32.0 seconds. Repeat with a 10-minute interval. 300 yards, trying to go a little faster this time, :31.5 to :32.0 seconds, over five hurdles, again, with a watch this time. He repeated five times trying to get over the third hurdle in:22.3 or :22.5.

On Thursday: 300 yards, trying to hit between :31 flat and :31,5. He ran over 5 hurdles again, and he repeated it three to five times.

On Friday; he jogged one mile on the grass. That is a good warm-up.

On Saturday: complete rest. This meet happened to be on Sunday.

That, gentlemen, will conclude my part of this discussion and I will be happy now to introduce yto you Josh Culbreath, the winner of the Russian Meet.

Mr. Hurt: Ladies and Gentlemen, this is Josh Culbreath.

Mr. Culbreath: There isn't much I can say except to reiterate what Coach Hurt just stated with the exception of a few things which you might be interested in.

Some of the things we have worked upon are purely theoretical. I am only five feet seven as compared to my competitors, who mostly stand six feet. There are only two hurdlers who are under six feet besides myself. One is, well, I don't think he is hurdling now, Yulin, of Russia, who is five feet seven and a half, and the other is Potgieter, of South Africa, who is five feet ten and three-quarters or eleven inches. All others are six feet or above.

We derived our census of the times of an individual in the 400 meter hurdles and his flat races this way: We estimate that he loses 4/10 of a second on a clearance of a hurdle. That is why we said most of the hurdlers ran four seconds faster on a flat race than on hurdles. I can give you a quick rundown on some of them. This worked, with the exception of two individuals.

Eddie Southern ran the 400 hurdles in :49.7. His time for flat 400 is approximately :45.5. My best time in the 440 flat, based on 440 time, is :50.2. It would give me :46.2, which is my best. Potgieter's time varies a little from that. His best in the flat is :46.6. This is still based on 400 yard dash time, taking 4/10 of a second off the 440 time.

Potgieter is a little behind, we think, and we find Liteiyev, of Russia, is, too. His time is :48 seconds flat, although he formerly held :50.4 seconds for the hurdles. Coach Hurt and I think this is because Liteiyev did not run the 400 flat enough times. In one year, I bet he had only run about four 400's. The same with Potgieter.

Good basic speed is required. I never had too much of that. It is only through Coach Hurt's guidance that I developed. I ran faster after I left college. I left school and went into law school and the Marine Corps. I always consulted him. Through these consultations, I developed into a much better hurdler. My time is :09.7 for the hundred yard; :46.2 for the 400 meter time.

If you are trying to compare the time with Glen Davis, he has :09.5 on the hundred yard dash; :45.4 for 400 meters. I keep records on all of my opponents, every distance they run, and study them. I study his strong points and I find my weaknesses, and I try to develop myself from that.

Another point we didn't mention about a hurdler is courage. He must not develop a fear of hitting hurdles. Many hurdlers are uncertain of their steps. They run up to a hurdle and then run around it. Coach and I worked on it for some time. Rather than put the hurdle there, I would simply get down to the blocks and run to where it would be. In this way, I don't think you develop the fear in a hurdler. If you place a hurdle in front of the hurdler, I don't think he should be taught to run around it. If he develops that, it will become a condition factor that he wants to run around the hurdle or he will slow up and lose a great deal of his relaxation. That is the basis of the 400 hurdles - - having basic speed, a lot of endurance and knowing the art of relaxation, which is almost impossible to try to explain how to attain.

TRAINING FOR CROSS COUNTRY

By: Bill Easton
University of Kansas

With the autumn days at hand, another cross country season will soon be in full swing. Distance men, anxious to do a good job, are out working over the rolling cross country courses building the foundation that may be achieved by fall distance running. The basic requirement for success is condition and this is acquired only through hard, diligent work. There is no short cut to success' for the champion. Success is the result of self-sacrifice and strict adherence to a work schedule over a long period. Each man must have an individual determination to work for self-improvement and the courage to give the time necessary to obtain the desired results.

Interest in cross country is growing in the United States not only on the collegiate level, but also in the high schools. State high school athletic associations, under the able direction of their secretaries, are becoming aware of the necessity for a longer period of preparation for high school boys running the mile and the half-mile in the springsschedules. Consequently, they are adding

Illustration 1. In this illustration the body angle is erect, the right foot is on the ground with the right heel just touching and the left foot kick-up high for a forward push-off. Illustration 2. The right foot drive is just starting with the left arm pull and high kick-up action. Note the hands are cupped but not clinched. Illustration 3 shows the body in full swing with the left knee coming through and the right foot and leg driving hard. Illustration 4. In this illustration the right foot is on the toes just ready to leave the ground. The left knee is forward but not too high. The body angle is straight and the arms are at the full point of the swing. Illustration 5 shows both feet off the ground with the body relaxed and in full running stride.

cross country to their fall programs to give the high school distance man the opportunity to build this needed base. Here the boy has the opportunity, in a supervised program, to condition his heart, lungs, and body. This background is an insurance against any possible physical injury that might be incurred by distance running, particularly if the boy will follow the rules of good training. This is an individual problem where self-discipline follows the pattern of clean living and regular habits. Running is as old as man and comes as natural to youth as does eating.

Our program, at the University of Kansas, was based originally on the great pattern of distance running taught by the late E. C. "Billy" Hayes of Indiana University. This, in principle, is still our basic pattern but it has been enlarged recently to include many of the Finnish Fartlek Methods. We find these individual programs better suited to our needs. The men enjoy the easy, change-of-pace work over the cross country course which is followed by individually prescribed pace and speed work on the track. Experience has taught us that too much work on the track during the fall becomes very monotonous and will eventually bring on that dreaded ailment, shin splints.

Here is an outline of the work pattern we followed for one week in mid-season:

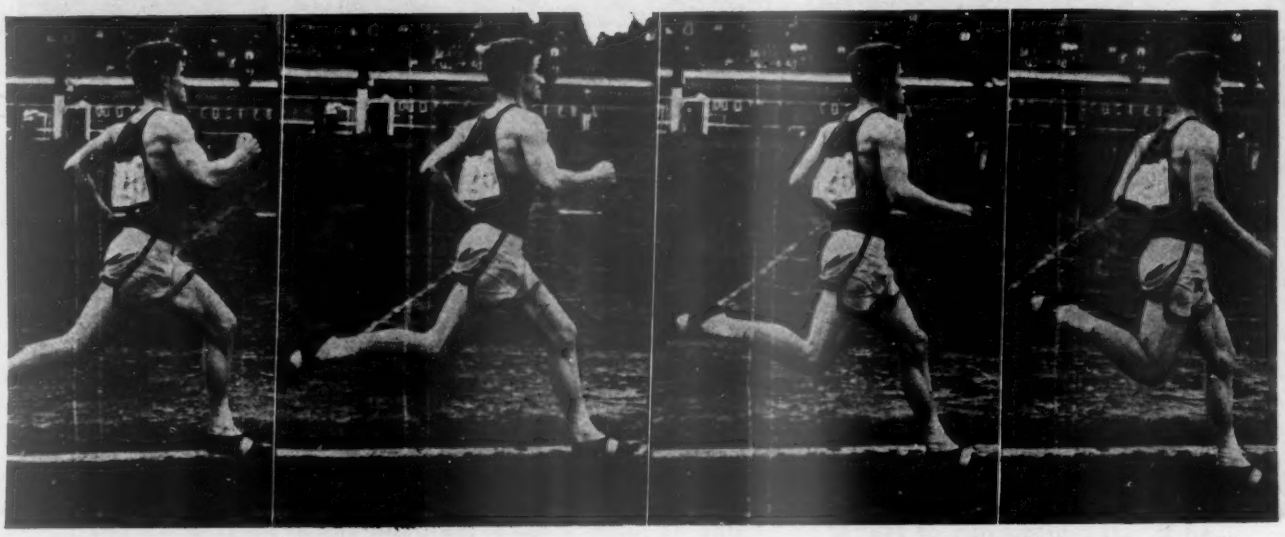


Illustration 6. The body is still in the air with the left foot on a descent to the ground. Note the slight arm swing across the body, but the shoulders and hips are still even. Illustration 7. In this illustration the left foot is still descending with the right foot now moving into high rear kick-up. This maintains easy, relaxed, leg swing. Illustration 8. The left foot is almost on the ground. The ball of the foot will touch first, followed by the heel for full rocker action. The right foot continues high for the rear kick-up. Illustration 9 shows the left foot has reached the ground and the right foot is at the top of the rear kick-up. The arms are at mid-body starting a new swing. At all times the head and body are erect with the eyes straight ahead.

Monday. The boys run three or four miles over the cross country course with the first eight to ten minutes at an easy pace for a warm-up. Then the pace is increased for a mile or a mile and one-quarter by the leader. He will vary the pace occasionally after warning the boys when this will be done. The idea is to keep them moving over the full distance so each boy will have the background of sustained effort for future use. After a fast five or six-minute walk, the leader may go into pace work on the track, against the watch, setting up the work according to the needs of the individual runner. We generally follow this with 110 yards of speed work on the grass. This, we have found, maintains speed with over-distance, and will build speed for later competitive events.

Tuesday. We have devoted this day to increasing each boy's knowledge of pace. After a good warm-up of two or three miles over the cross country course we move to the track to check pace knowledge. Here again, the workout is suited to the needs of the individual man and naturally is very flexible. The coach has many opportunities to suggest two or three possibilities for each man, with the ultimate result - knowledge of pace, plus some speed work. It is extremely important that speed work be maintained with the boy's over-distance background if he desires to improve his times. Here are a few suggestions the coach might offer:

1. A mile and one-half with a timed check on the last quarter mile.
2. Three separate half miles with a decrease in time for each half, followed by a walk around the track between each half mile.
3. Two separate miles, running the first on pace and improving the time of the second mile to about seven-eights performance.

It will be found that the second mile will be much easier for the runner than the first. This is because the runner's heart, lungs and circulation have been put in perfect running condition by working through the first mile. The day's workout should be completed with easy sprint work on the grass.

Wednesday. This is the day on which we try to strike the happy medium between over-distance and speed work. After a preliminary warm-up, with variations of pace over the cross country course, we start our work on the track with emphasis placed on under-distance speed work. The runner may choose to run three-quarters of a mile at a fast pace and after a short walk follow with a fast quarter; or he may choose separate quarters with his pace time set up faster than he would ordinarily be running these quarters. Both of these workouts are done under pressure, with very little rest between them, so that the runner does not recover entirely from the first workout before he starts the second. Through this method his endurance and speed background are combined for improvement. Most of our men complete this workout with an easy half-mile around the field.

Thursday. There are many theories concerning the correct workout for this day. Some coaches think Monday's workout should be repeated, while others recommend the athlete do nothing. We use Thursday primarily to work up a good sweat and if necessary give a limited amount of short, fast speed work. This problem can best be decided by the coach and the runner.

Friday. When a meet is scheduled for Saturday. Friday should be used as a day of rest. Some boys will want to take an easy warm-up and if they do this should use an easy jog with possibly very little speed work. This workout, with light calisthenics, seems to relax the boys and prepare them for Saturday's competition. On this day the shower should be held to a tepid temperature and should be of short duration.

SPEED TRAINING FOR DISTANCE RUNNERS

By Dale Ranson
University of North Carolina

There is a significant and spectacular new trend in the training of distance runners. Research which began in 1951 by the Hungarian coach, Mihaly Igloi, produced conclusive evidence in the form of eight world records in 1955 and other significant performances to support a theory that distance runners could be trained effectively by repeated short runs of 100 yards through the 440.

Our independent research work at North Carolina along these lines, started in 1955, substantiates the thesis that repeated short runs and various combinations condition the athlete adequately for any distance from the 800 meters through the 10,000 meters.

By way of extreme illustration, a single workout could be the running of 100 times 110 yards which would give a total distance of 6-1/4 miles plus the 50 to 440 yards slow-down during intervals of recuperation. However, this would be an extremely dull, monotonous procedure. It is much better to use a combination of various short distances in any single workout. I would also advise that for additional variety the entire workout one day each week be fartlek. We also include a brief fartlek run as part of each warm-up and to taper off after workout.

Listed below are examples of a few suggested workouts:

A.	1 x 330	Repeat sets 4 times	4 x 330 = 3/4 mile
	6 x 150		24 x 150 = 2 miles
	1 x 440		4 x 440 = 1 mile
B.	1 x 110	Repeat series 8 times	8 x 110 = 880
	1 x 220		8 x 220 = 1 mile
	1 x 330		8 x 330 = 1-1/2 miles
C.	8 x 110	Repeat 5 times	40 x 110 = 2-1/2 miles
	1 x 440		5 x 440 = 1-1/4 miles

INSTRUCTIONS

1. Warm-up easy 1 mile to two mile on grass, stride 10 easy 100's on the grass, stretch and exercise for 5 to 10 minutes.

2. Use 100, 220 or 440 intervals between all short distances in each workout. Shuffle or jog during recovery interval; do not sit. Actually the work should be continuous once begun.

3. Each runner should work in a small group with athletes at his own level of competition and, if possible, with the men in his particular event.

4. As the runner improves in condition, the speed of the running is increased and the intervals shortened in most instances to 50 or 100 yards.

5. Repeated short runs tend to instill good mechanics.

6. The basic speed at which the athlete runs is determined both by his event and his progress. For instance, the speed for the half mile should range from 55 to 60 seconds, from 60 to 64 seconds for the mile and from 64 to 68 seconds for the two mile.

7. The lead should be rotated between the total number of boys in any work group.

In 1957, Coach Mihaly Igloi and Laszlo Tabori came to Chapel Hill and remained for approximately four months. During that time several of my runners worked with Tabori and later, during Coach Igloi's last seven weeks in Chapel Hill, he took a group of average members of my track squad and worked them entirely. The progress results were equal to or better than the results achieved by using longer distances in workouts.

At Austin, Texas in 1957 I disclosed my version or adaptation of this revolutionary conditioning program to two outstanding young college coaches. Their experience absolutely confirms the practicality and effectiveness of training boys for the longer distances by using repeated short runs and various combinations.

BROAD-JUMPING ANALYZED

By: Don Canham
University of Michigan

For years, coaches have taught that "great" broad jumpers must be "great" sprinters. Yet at least four of America's 26-foot broad jumpers were not great sprinters.

George Brown of U. C. L. A., John Bennett of Marquette, Greg Bell of Indiana, and Ernie Shelby of Kansas couldn't be classified as outstanding sprinters. They became world class jumpers because they specialized in the event and perfected all the details of the technique.

If there's anything new in broad jumping, it's the practical contribution made by these and other recent jumpers to prove that physical requirements are wide and varied. George Brown was tall and thin, Bell and Bennett short and slight, while Jesse Owens was of medium height and build.

Speed, of course, is not a handicap, and the next world record holder might well be a great sprinter. While we now realize that blinding speed isn't essential in jumping over 26 feet, we must recognize that average sprinting speed is a certain requirement for almost any championship performance.

In addition, a lightness of foot called "bounce" or "spring" is evident in all good leapers, for the ability to convert the forward momentum to vertical height off the board is essential to even fair broad jumping.

In addition to these physical requirements, all broad jumpers must have determination, courage, analytical ability and plain patience. As in any complicated technique, success doesn't come quickly. The world's finest jumpers have all been 22 years of age or over, and some like Bennett and Bell didn't attain their peak until the age of 25 years - - after literally thousands of jumps.

In teaching, coaching, and understanding the broad jump, we must consider six different areas from the first step to landing. The wise coach and athlete will master each area in turn and through work and concentration mold the phases together in one continuous well-executed action of performance. These areas are:

1. Initial relaxation.
2. Smooth acceleration during the "run-up" to the board.
3. Settling before the board.

4. Foot plant and take-off.
5. Leg and body position in flight.
6. Leg extension and landing.

FIRST STRIDES

In dealing with each area in turn, we must start as the athlete first steps on the runway. One of the most neglected phases of jumping is the failure to consider and analyze what the first few strides of the jumper's approach can mean to his actual effort.

The entire tone and rhythm of the jump is often determined as the athlete starts, just as the preliminary swing of the discus determines the speed and rhythm with which the thrower will turn and release the discus.

The broad jumper who grits his teeth, sets his jaw, and swears he'll leap out of the stadium usually is so tense upon reaching the board that he has no chance of hitting his check-marks and less chance of taking advantage of his actual jumping potential at the board.

So, without the slightest doubt, we must emphasize and constantly watch to see that the initial effort is determined but not tense. One method of getting an athlete "away" relaxed is to have him "fall off" his first check-mark into his first step. In short, a relaxed loss of balance into the first stride - - and not a hard driving, fist clenching step.

THE ACTUAL RUN

From our indoor sprinting marks, we can readily realize that even the top sprinters cannot accelerate to full speed in less than 40 yards, and some cannot do so at that distance. It would then appear that the runs of our jumping champions should exceed 40 yards or 120 feet, and that's exactly the case.

Steel, Bennett, Bell, and almost any other 26 foot jumper will use an approach of 125 feet or over. Some like Steel exceed 140 feet, and it's probable that the great jumpers of the future will approach from even greater distances as they attempt to apply more and more momentum to the run. Today, even our high school athletes are using runs of 110 feet and more.

Regardless of the distance to be covered in the run, however, the athlete should use a minimum of two check-marks. He stands on the first at the head of the runway, and the other he "checks out on" (hits) a minimum of 45 feet and a maximum of 60 feet from the take-off board.

Where excessively long runs are used, three check-marks are often em-

ployed. With a run of 130 feet, for instance, the jumper might have his second check mark at 90 feet and his third 45 feet from the toe board.

It's entirely possible that when all our jumping is done from consistent asphalt runways similar to those at Penn State, Ohio State, Purdue, and Michigan, our jumpers will drop to only one check-mark in short runs or two check-marks during the excessively long run-ups.

Presently, where runways differ in consistency and condition from meet to meet, it seems more practical to use a maximum rather than a minimum number of check-marks.

While there's no secret in locating accurate check-marks, there is a simple and effective formula. With the athlete standing on a mark roughly 110 feet from the toe board and the spotter 50 feet from the board, the athlete "falls" from his mark.

His first step should be taken with his take-off foot, as he must think in terms of that foot for first step, for hitting check-marks, and for take-off. Alternating of the feet at these various points only confuses.

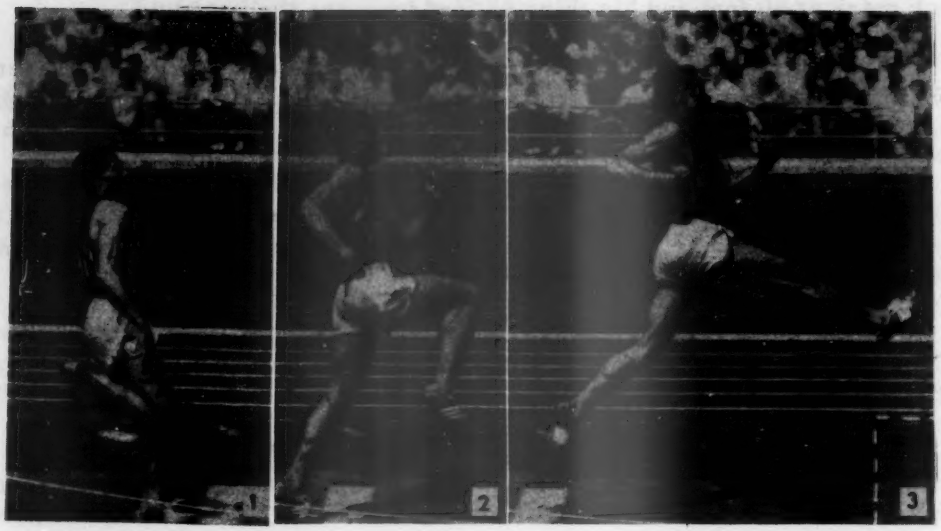
Once he starts toward the second check-mark, he attempts to build up as much speed as possible in the 60 feet to the spotter. The athlete can slow up and stop after passing the spotter, for during this stage of step determination we're only concerned in finding where his left foot lands after 60 feet of all-out approach.

The athlete takes this preliminary approach several times a day over a period of several days; and on each run-through, the take-off foot landing about 60 feet from the first check-mark is marked. Obviously, then, the second check-mark is determined by taking the average of all the take-off foot landings in front of the spotter.

In this manner, a constant uniform run between two check-marks can definitely be determined. It's then a simple matter to lift up both check-marks and move them the same distance forward or backward that's necessary to place the athlete on the board once he starts his full run-through.

While this method is widely used and is simple and direct, two observations must be made. First, it isn't possible to determine any step pattern by any method unless the athlete is in "sprinting fit" condition. A poorly conditioned athlete cannot run with a uniform stride time after time without a good amount of basic running prior to step location work.

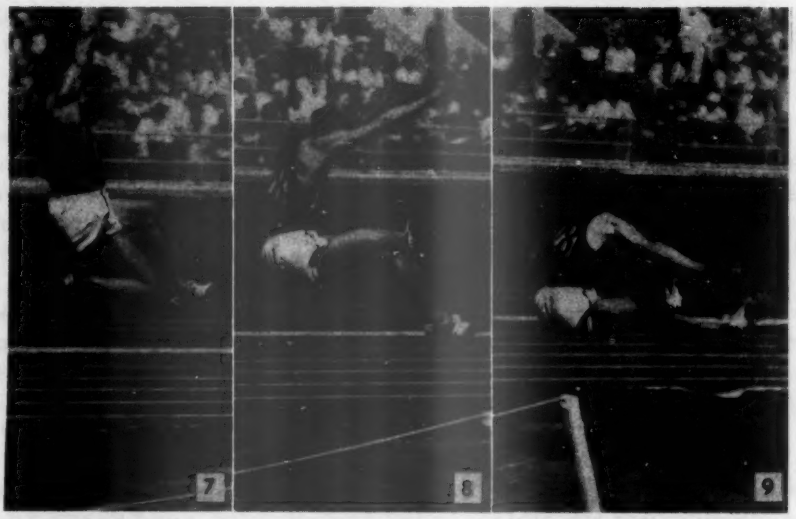
Second, though the run between the first two check-marks will no doubt



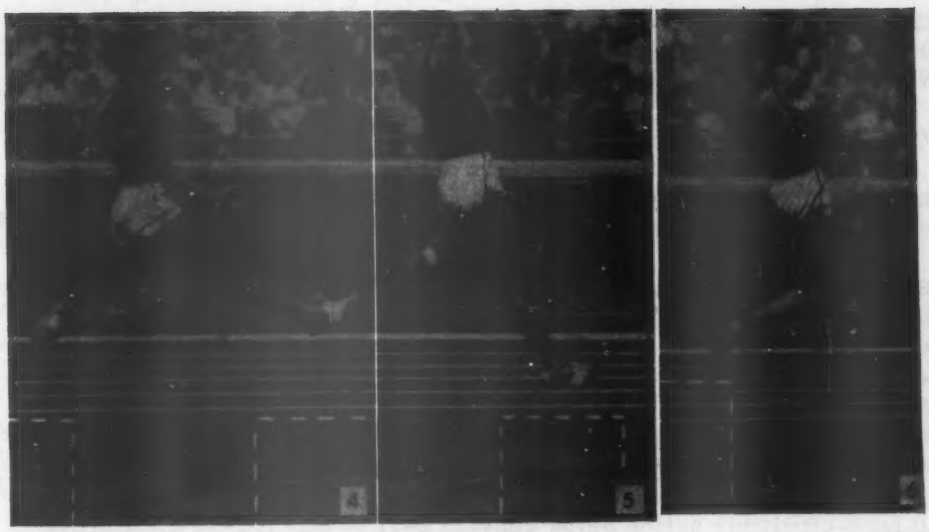
GREG BELL

Perfect Exemplification of Step Style of Broad Jumping

(1) foot planted slightly ahead of the center of gravity; (2) excellent lift of the left shoulder and right knee as he jumps up, not out, from the board; (3) extension of right leg



(6) the left leg coming through and forward as he jumps from the imaginary box; (7) both legs swinging forward; (8) legs being extended; (9) perfect leg extension; (10) feet



into the step; (4) drawing up of left leg and erect trunk in the flight; (5) the athlete is now stepping on the imaginary box with his right foot.

coming together so they'll be about 8 inches apart when athlete hits the pit; (11) the athlete preparing to flex knees, drop head, and shoot over his feet.

be satisfactory on the surface they were originally plotted upon, it goes without saying that adjustments must often be made on other runways at other meets due to varying conditions. These adjustments should be kept to a minimum as confidence in any step plan can only be gained through a minimum of change.

Once the steps have been accurately determined and measured, the athlete mustn't run through or jump in practice or competition without having taken a thorough warmup and without having measured his steps with a steel tape and marked the exact spot with a scratch on the ground or a peg along the side.

Some coaches advocate the counting of strides between the check-marks to make the athletes more conscious of hitting those marks. Most American coaches, however, feel this practice detracts from the more important concentration on relaxation, speed and competitive effort.

Once the athlete is "check-mark sure," he can more easily concentrate on the actual function of the run. Quite simply, the approach to the board should be one of acceleration, or building up of velocity, and maintaining it until the foot plant and take-off lifting action helps convert part of this forward momentum into vertical height.

Several things contribute to acceleration and, more important, to maintaining and using it properly. Many men can move down the runway with great speed. Some, however, get so tense concentrating on speed that the actual effort off the board is dismal. The ideal approach is one that's relaxed with the body nearly erect to keep the trunk adjustment just prior to foot-plant at a minimum.

The athlete, however, must have generated the greatest amount of momentum he can use effectively by the time he has reached the second check-mark, that is, in the neighborhood of 50 feet from the board. From that point on, the relaxed maintenance of that speed and the concentration on the actual jumping effort must take precedence over any effort to increase momentum.

A slight adjustment, mental and physical, must be made about four strides before the board is reached. In a sense, the athlete "gathers" himself for the actual jumping effort. But a more correct mental picture is obtained of what he actually does when we refer to the action as "settle."

SETTLE

In the settling action, the jumper relaxes and drops slightly lower on the balls of his feet than he has been during the sprint action of his approach. With this slight dropping down, the jumper's trunk also assumes a little more erect position, placing him at a more advantageous angle for foot plant and vertical take-off.

This relaxed settling action must never result in loss of forward momentum. In actuality, with great jumpers, the floating last four strides result in increased speed at the end of the run. The athlete must constantly remember that the settle is merely a relaxed adjustment in preparation for a vigorous explosion off the board.

In studies of many of the world's greatest jumpers, it's obvious that the last two strides are slightly shorter than previous ones. There are two reasons for this.

First, men preparing for a leap subconsciously attempt to keep their center of gravity over the take-off foot. People who've done even a minimum of jumping have soon realized that a long, stretching, last stride places the center of gravity too far back, and a much too great checking of the forward momentum is the result. In addition, a tremendous strain is placed on the jumper's legs as he attempts to come out of this unnatural position, which often results in injury at take-off.

Second, the last two strides are shorter because in even the most simple spring action the knee must be bent to drive up from. A long-reaching last stride results in a straight and in some cases, a locked knee, which, of course, cannot deliver any vertical force to the jump.

It appears that far too much time and effort are given to determining how much the last strides should be shortened, for it varies with each jumper. In actual practice, the jumper's body angle during the "settling" action is the best regulator for optimum shortening of the steps.

Jumpers who do not settle, and thus bring their body angle to a more erect position, without exception shorten up too much as they mentally prepare for the leap. Thus, the problem is usually not one of trying to get the jumper to shorten stride, but more often just the opposite. In most cases, jumpers shorten up too much. Therefore, the erect trunk during the run and certainly during the settle becomes of primary importance.

Where we find jumpers dropping off more than 6 inches on their last stride, we can usually remedy the situation by having him use a more erect body angle and thus a slightly longer stride.

Another technique during the "settle" is "hip drop", or the lowering of the center of gravity just prior to foot plant. Telling the athlete to "crouch," "drop the hips," or "bend the take-off knee" can only detract from his concentration on the actual jumping effort, and shouldn't be done.

A jumper, by the time he has reached the board, should be thinking of

only one thing - - and that's the "lifting action" that will give him height. It's like telling a high jumper to "drop low" just before he attempts to generate all his energy in a vertical leap - - an absolutely futile suggestion.

Any study of broad jumping pictures shows that just prior to foot plant the hips actually do drop. This, however, isn't a conscious effort on the part of the jumper. Rather it's a result of other things correctly done.

The actual dropping down off the high toes during "settle," the erect and then slight backward trunk angle just prior to foot plant, and the slightly shorter last strides with the resulting bent knee are the causes of necessary and effective "hip drop." A magic word or two said to a jumper won't solve the problem.

FOOT PLANT AND TAKE-OFF

The actual foot plant at the board isn't a vigorous "stamp" as is so often advocated. In fact the use of the term "stamp" should be eliminated from the track coach's vocabulary, for the action isn't a stamp but rather a heel-ball-toe roll-up as the athlete springs from the ground.

Jumpers who attempt to "stamp" or "pound" the board at take-off invariably do so with a tense, contracted leg. This destroys all chance for a relaxed flexing at the knee and prevents capitalization of the quick extension that comes f from a relaxed muscle. The plant is a firm relaxed placement of the foot - - toes pointing directly forward at the board - - heel first.

To further assist in converting some of the forward momentum to vertical height, the previously mentioned slight back body lean takes place as the heel comes down. The center of gravity is now behind the board at heel plant. It will, however, move directly over the take-off foot as the knee flexes and the jumper's body continues to go forward.

Then, just before the jumper leaves the ground, the center of gravity will move out in front of the board. As the center of gravity moves forward, the athlete coordinates the lifting action of virtually all of the body with the extension of the take-off leg, ankle and toes.

From the time the rock-up action of the foot starts, the athlete must concentrate all his energy and effort on driving the chin, chest, arms, and free leg as high into the air as possible. In addition, the jumper's head and eyes turn up at the same time.

As the foot is on and over the board just a split-second, it should be obvious how little adjustment an athlete can make during that particular stage. It's only through weeks and months of work that the ability to attain maximum verti-

cal height off the board during this split-second is possible.

The secret of great jumpers lies in the countless hours they've put in during practice taking "pop-up" using a short 30 to 40 foot run. The lifting action when done so many times with a short non-fatiguing run becomes mechanical and is often perfectly executed when a full run is used in competition.

BODY POSITION IN FLIGHT

It has been said so many times that form in the air or a particular style is primarily advantageous for "aerial balance." This is quite true, but form or body position in the air should serve the athlete in a much more practical fashion.

Body position after take-off is of value in proportion to the extent to which it enables a man to get his legs up and forward prior to landing. Some athletes find they're able to do this more easily and more effectively with one style than with another.

While we see a multitude of jumping styles each year, there are really only four established and basically sound methods: (1) the Tuck, (2) the Hang, (3) the Step, and (4) the Hitch Kick.

THE TUCK STYLE

The most simple but probably least efficient method of jumping is called The Tuck Style. In this style, the jumper tafter take-off merely draws the trailing leg up to the kicking leg and sails through the air in a ball with legs tucked under the body. Just prior to landing, both legs are swung out and forward before the heels hit the pit.

Despite the fact that many of our good high school jumpers use the "Tuck" and James Holland of Northwestern approached 26 feet using it, the style has several limiting factors.

First, the great tendency is to draw the trailing leg up under the body too quickly, thus not completing the take-off.

Second, men drawing their legs up suddenly also have a tendency to draw the upper torso down, and that makes lifting and extending the legs forward prior to landing more difficult.

Third, the breaking of continuous forward action of the body by the static tucking of the legs means that the jump is done in stages. For that reason, the

"Tuck" style isn't usually one which permits a smooth, continuous motion.

THE HANG STYLE

While Eulace Peacock of Temple and Lutz Long of Germany have been the best-known jumpers to use the "Hang," countless others have cleared better than 25 feet with it.

Simple physics tells us that it's impossible to increase body momentum in the air. Thus, a simple technique in mid-air is all that's necessary. The most effective and one of the most easily mastered styles is a soaring action with subsequent extension of the feet to gain maximum distance. This style has been named the "Hang."

Following a proper take-off with the Hang style, the athlete reaches his maximum height with the chin and chest up, the back slightly arched, and the feet trailing slightly behind the rest of the body. The arms are forward and out during flight for balance.

As the jumper reaches the crest of his flight, there must be a forward swing of the hips to make the lifting of the feet less difficult. As the hips move forward, the legs are extended and the feet brought up so the heels are about level with the hip bone.

There's naturally tremendous stress put on the abdominal muscles at this time. With the arms also forward, there's now a slight forward curve of the back in evidence. In this sitting position in the air, the feet are about eight inches apart with the knees slightly flexed in preparation for landing.

At first glance, the Hang style seems exceptionally efficient and direct. There is, however, a limiting factor that will probably discourage the world's first 27-foot jumper from using it.

Every principle of coaching in the field events is one of continuous acceleration once the action is started. Any pausing or hesitation, we've learned, tends to destroy forward velocity. So, when we see an athlete "hang" in the low back position as he floats during the course of the action, the exact efficiency of the form is open to question.

The ill-effect of violating this "continuous action" principle is noticed as the athlete begins to lift his legs forward into the sitting position. The lifting of the static legs requires greater abdominal strength than it would had the legs been moving forward during the "hang" position.

In addition, as the legs do start forward and up we find the jumper's

trunk tending to come down due to the action and reaction principle of physics. It's for the latter reason that hang jumpers don't keep their legs moving forward during the hang. If they did, the premature drawing down of the trunk by the early leg lifting would eliminate the real advantage the style possesses.

THE STEP-STYLE

In reality, the now universally used Step Style bears some resemblance to the Hitch Kick Style - - the difference being that jumpers using the Step only take a step and a half in the air. Hitch-kickers often just continue to run in the air; often without purpose or reason, as they execute another complete leg cycle before landing.

The Step Style, as used by Gourdin, Steel, Owens, Bennett, and Bell, is no doubt the most effective style yet devised. It allows for a full and complete take-off from the board, as there's no need to bring the take-off leg forward quickly; it provides a smooth, natural, continuous action in the air; and it leads to easier and more complete lifting of the legs for landing for the following reasons:

1. The trunk is erect in flight.
2. The lower leg swings like a pendulum to aid the abdominal muscles.
3. The legs are in continuous motion foward during the jump.

In the Step Style of jumping, the athlete actually bicycles in air. Presenting the action to the athlete in just that way often aids in teaching.

A true step jumper takes one step in the air between take-off and landing. The jump starts as the kicking or free leg drives upward at take-off. At the top of the jump, this take-off leg steps down just as though the jumper were stepping on an imaginary box, while the take-off or trailing leg comes through in rhythm, knee first.

Now the action of this trailing leg becomes much the same as that first used by the lead leg as the athlete jumps from the imaginary box. With the take-off leg now leading the jumper --- knee first --- the final phase of the action is starting, as the free leg (original kicking leg) comes up to the extended take-off leg.

It should be noted that the take-off leg action throughout the jump is continuous and smooth as it comes off the board, swings forward, knee bent, and raises up and out in front of the athlete for landing.

On the other hand, the action of the free or kicking leg during the jump

starts forward off the board, drops down during the step (to counter-balance the drawing through of the take-off leg), then is swung up forward and out as the legs come together extended for landing.

A feature of this style is that, due to the continuous, vigorous, leg swing forward, the trunk actually tips back rather than forward prior to landing. The raising and holding up of the legs in landing is thus made easier for the athlete.

THE HITCH KICK

There's so much confusion as to just what constitutes a true hitch kick jump that some of our leading texts and coaches are in complete disagreement on it.

The hitch kick is, actually, another complete leg cycle in addition to that described for the "step" style. In general, it's an outdated style, too complicated for the average boy and offering no advantages not seen in the "step" style.

In addition, the more complicated action makes it extremely doubtful that this style has any extraordinary potential. One rarely sees a true hitch kicker on American tracks, but exponents of the style still appear occasionally in Europe. It's probable that these jumpers would be just as effective or even better with the less complicated "American Step Style."

LANDING

Regardless of style, landing in the pit is an art in itself and the inability to incorporate leg lift into the jumping style has handicapped many fine athletes.

The landing position is important and should be constantly stressed. The longer the heels are kept off the ground, the longer the jump. The maximum point is when the hips land even with the heels. Over this, the feet are dropped too soon; under, the feet are too high.

The style in which the jumper stiffens one leg and relaxes the other so that the body is swung to one side is preferred; but many good jumpers merely go through the knees. The important fact is that form is unimportant, except to keep the heels off the ground until the last possible instant.

A coaching point is to tell the man that for every inch he can keep his heels off the ground, three inches are gained for the jump, since he's coming down at a 30° angle. While this may be theoretically true, practically it should be used only as a psychological point.

It's evident, then, that regardless of method of type of landing used must

be designed to make it possible for the jumper to get his feet as far out into the pit as possible during landing. Though some coaches prefer the "swing-out" landing, the vast majority of American jumpers use the more efficient and simple method of merely going through the knees and over the feet when the heels touch the pit.

Other jumpers have developed variations of these accepted methods. Greg Bell, for instance, carries his legs into the pit practically straight so that when he lands his body pitches or vaults over his feet. Owens, prior to landing, would turn the body in flight, his method being a variation of the "swing-out" but with both legs semi-straight.

Landing, regardless of style, requires as much practice as take-off work. Literally hundreds of short "pop-up" jumps with the athlete working on holding his legs up and out when landing are a necessity in the program of every jumper. Once he learns the technique of leg lifting, he can concentrate on getting over or through his feet so he doesn't fall back in the pit.

In going through the legs and over the feet, the jumper must do four coordinated things to prevent sitting or falling back into the pit. As soon as his heels touch the pit in descent, the jumper must:

1. Drop the chin to the chest.
2. Break forward at the hips.
3. Relax and let the knees bend.
4. Swing the arms downward and back.

The most difficult and most important phase of landing is, as mentioned, the holding of the legs and feet forward and up during the descent. Tremendously strong abdominal muscles are the best assurance that this will be done correctly.

In addition, a simple coaching point has helped many raise their feet: When the legs swing forward, ask the athlete to raise his "shoe laces to eye level" during descent. This may not be quite possible, but often accomplishes quite simply and quickly what the coach wants to have him do.

In almost every landing, the feet are slightly spread as they drive into the sand and shavings. In the method that enables the man to go through and over the feet, this foot-spread is essential. The actual distance that the feet are held apart is between 6 and 8 inches. Any wider spread would lead to an appreciable loss of distance in the measured jump.

THE HOP, STEP AND JUMP

By: Adhemar Da Silva
Olympic Champion
Brazil

I would like to say thank you because it is a great honor for me to come to this seminar to perhaps help somebody. I think it is better if I talk in Spanish, because most of the people here understand Spanish. I have a little trouble in English explaining everything. That is the reason why I would like to present a good fellow, Ben Almagear, who will interpret.

As you can see, I am a little old to be participating in this sport. I am 32 years old and I first started hitting top-notch competition in 1949. In the last ten years I have won two Olympic championships, as well as having set the world's record, and have been in consistent competition since 1949.

I began track competition in 1946 simply for the purpose of making my parents happy. All the people in Brazil prefer, of course, the soccer football. I am sure you are all aware of soccer football. I am not to be distinguished from the other Brazilians, and I, too, enjoyed soccer football tremendously. However, each time I played soccer football my parents would constantly warn me to be extremely careful for the club I played with did not have financial aid and the place where I worked did not give me any health insurance.

As a result, they did not want to be liable to a sum of expense for all the injuries that I might incur. Every weekend, I would take my bag with all my soccer football equipment and my parents would become somewhat angered with me because I was going out to play soccer. I liked it because for a number of years I was on the first string, as you call it here. The reason I was on the first string was because I was one of the founders of the club. Otherwise, I had in the Constitution if I was not on the first team, we would disband!

After some time I reconsidered my parents pleas and realizing that I was the only son - - the only child, in fact - - I finally conceded to their desires and retired from soccer and was introduced to a track club by one of my friends. This was about the middle of 1946.

I first started by participating in all track and field events. In six months I participated regularly for this club of mine in many, many events and did not score one single point. In other words, one of the mottoes of my club which I, of course, always followed was "Perserverance Always".

Late one evening in 1947 as I was walking across the field I noticed one fellow jumping three times, and I asked him, "What are you doing?" His answer was, "I am doing the hop-step-and-jump." The next question was, "How do we do this? How do you begin and how do you employ your legs in this event?"

He gave me a very brief explanation and then I asked permission to try this event once. I feel that I had a trememdous amount of luck the first time because everything hit perfectly. The other fellow who was jumping was very much impressed with my agility. That first jump measured approximately 12 meters 84.

At the time that I tried this first jump not only was my friend amazed, but it so happened that one of the coaches was glancing that way and he, too, saw the first jump and was somewhat amazed at the agility I had.

Three days later I entered a competiton from the San Pablo Football Club I belonged to against another visiting club and I won this competition with a jump of 13.05 meters. The coach immediately asked me how far I had jumped and I mentioned that it was 13.05 meters and, of course, the coach would not believe it. My answer was, "Believe it or not, the officials measured it at that distance."

A week later I entered a novice competition. At that time I jumped a little over 13.56 meters. It was my first official competition - - sanctioned competition, as we call it here. It was my first record.

A week later there was a novice championship which we would probably call here the junior championships. There I almost hit the 14 meter mark - - 13.98. Two weeks later, at the junior championships, I jumped 14.22 meters.

In 1947, after six months of training, I set the state record at San Pablo, which was 14.77 meters. This was the year in which I actually began to concentrate on the hop-step-jump.

After this happened my coach told me, "Now is the time to learn to jump." This was my best jump - - 14.77 meters. In order to qualify for the Brazilian Team for the 1948 Olympics in London I was required to jump 14.80. My friends, of course, encouraged me and constantly informed me I was going to visit London. I, of course, wasn't as sure as my friends, because I realized that in order to qualify for the team I would have to break the existing record.

In May of 1948, they had their elimination meets. In the second hump I hit 15.03 meters, and this jump qualified me for the Brazilian team, of course.

Now, I am going to relate some strange instances that sometimes happened in Brazil. As I mentioned at the beginning of my talk, the Brazilian people are crazy for soccer football. As a result, fan participation was not too great in this sport.

The most I had ever seen at any track meet was five to six hundred people. Then we got to Wimbley Stadium in London and I realized there were about 120,000 people viewing the game. I, of course, could not believe that there were there to watch the track events.

As a result, I was so awe-struck by such a multitude of people that I forgot to prepare myself for the jumps and didn't warm up or anything else. As a result I finished 11th but nevertheless I enjoyed the trip tremendously and it was an experience in itself. However, in 1949, I trained very, very hard and in this year I established my first world-ranking mark with a jump of 15.51 meters. This, of course, was important to me because it also established a South American record which was formerly held by an Argentine named Ruflito at 15.42.5 meters. This was all in 1949. The record set by the Argentian was set in 1924 and then, 25 years later, I came by and jumped 15.51. I was born in 1927. It was a tremendous honor to me, I thought, because I was the one South American who had broken an old record after it had stood for 25 years.

In 1950 I equaled the world's record at 16 meters. That was established by Naoto Tajima, of Japan. In 1951 I jumped 16.01, setting a new world's record by 1 centimeter. My golden year was 1952 because in the Olympic Games in four consecutive jumps I established new world's records of 16.05, 16.09, 16.12 and 16.22.

In 1953 my record was broken by Scherbakov, of the Soviet Union, at 16.23. At that time I seriously considered retiring from track but, nevertheless, I continued training for no specific reason.

We have a very good expression in Spanish for this which cannot be translated, but for some reason I had an inner drive that forced me to continue my training, but with no sight on any competition at all.

Finally I did enter more competition and still I could not surpass my 16.22 until I made the team in 1955 for the second Pan American Games in Mexico City where I jumped 16.56, which is about the distance I am presently jumping. After having jumped this I once again thought seriously of retiring from the track but my friends encouraged me to continue, at least until the Melbourne Games.

I continued then, not only for myself and for my friends, but for my parents, my wife, and even for my children. For these various reasons, I continued training until the Melbourne Games. I had no idea or no thought of winning this particular event at the Melbourne Games. I had hoped for possibly a fourth or may be a third. But, fortunately, there are good people in the track and field and they let me win first place!

After the games at Melbourne I sort of took life easy and did not train very

hard until I heard that another competitor from the Soviet Union had broken my record, jumping 16.59 meters. This did not surprise me too much because there is a constant change in record holders. In Soviet Russia presently there are eleven that I know of who can jump over 16 meters on any given day on the hop-skip-jump. I think it is impossible for one man in Russia to hold the record too long with so much competition.

I presently have two sons. As I left my wife to come here I told her, "Look. We have two sons. I do the hop-step-and-jump which are three particular events so that means we are one down!"

She said, "All right. That is fine. We have two sons but we have only two Olympic Medals. Therefore, let's do it completely. If you want that third son first go to Rome and bring back that third medal and then we will be complete."

Now, concerning the hop-step-and-jump: First of all, my running approach is around 35 meters. I consider myself very, very slow. I am not fast. Therefore, I have to employ agility more than speed.

Some people have asked me, "Could a good sprinter be a good hop-step-and-jumper?" My answer to this is always,"No", because the speed of a sprinter would tend to hamper his form on the hop-step-and-jump. With the hop-step-and-jump you must have a tremendous amount of balance, agility and very, very strong legs.

My approach is very similar to that of broad jumping and pole vaulting and I feel that my final steps must be concentrated effort on relaxation and not any more on speed. My foot plant - - heel first, sort of a rolling motion, and then forward. As a result, I cannot be leaning back too far nor be leaning too much forward because any extreme either way would hamper the jumps.

Chairman Snyder: Where are your eyes focused? Where do you look?

Mr. Da. Silva: Always straight. I feel that one must look directly forward because the head has a tendency of guiding the body. If lowered too much, it gives the body a tendency of going forward and if turned back too far, it gives the body a tendency of going backwards.

Chairman Snyder: The center of gravity is a little ahead at the time of the take-off?

Mr. Da Silva: Yes. I bring up my left leg with a tremendous amount of force and speed. On the hop this gives me a distance of anywhere between 6.20 and 6.30. Then begins the arm movement.

Most people say that my secret in this hop-step-jump is on the step where I employ my arms. To me, it doesn't seem to be a secret because it comes pretty

natural to me. As a matter of fact, I work very relaxed. It wasn't until after a tremendous amount of training and years of doing this that I really began to realize the important function of the arms.

The arms must be employed to bring the body forward, and it helps me to maintain balance. They also help me to gain more distance in the final jump.

From the Floor: One other question. What exercises do you take to practice getting the hang in your step?

Mr. Da Silva: The name of the exercise is kangaroo (demonstrating). That is the type of exercise. But it must be done with speed, power and, of course, concentration on balance at all times.

From the Floor: Coming out of your hop, going into the step, how much emphasis do you put on your step?

Mr. Da Silva: I feel the important thing is arms and balance - - equilibrium. This is very difficult to explain because all I know about it is I jump. I don't know the technical aspects of it because in Brazil they don't thave the equipment nor the ability. They don't have the films whereby I can study my own techniques. Therefore, I have never given much study to my own techniques. All I know is that I jump and I don't think I can get down to some technical aspects about it.

From the Floor: Some of our boys don't get enough out of their steps. We are trying to find out what exercise or what they can do with their hips to get more out of the step.

Chairman Snyder: I watched him yesterday afternoon working on just the things that make him the hop-step-and-jump champion.

From the Floor: I realize that. But is there anything you do with the hip or the knee when you pull it through?

Chairman Snyder: I would say he slows down everything in this exercise where an American boy is like this - - pop, pop, pop.

Mr. Da Silva: Rhythm is most important - - more important than speed.

From the Floor: When I hop, step and jump, I always try to emphasize the knee, not the hips. I do emphasize bringing that knee up high on the step so when I sail through the air I am going up.

From the Floor: What I was trying to get at is that you have a slow, deliberate hang. Do you practice that deliberately?

Chairman Snyder: Yes. The Japanese have the same thing. Dr. Ode, who is fifty years old can still do it.

In your exercise, do you make any attempt to stamp the foot down or do you just ride down?

Mr. Da Silva: Just ride down.

Chairman Snyder: The Japanese do the opposite.

Mr. Da Silva: That is the reason the Japanese only have one or two seasons and they they are finished, you know.

Chairman Snyder: The legs won't stand it! I am afraid we are going to have to stop, gentlemen. Will you be taking any workouts before the games - - maybe tomorrow?

Mr. Da Silva: I don't know. It depends on how I feel.

Chairman Snyder: These men would like to see you and also the Park Commission would like to take some slow-motion pictures of you out on the field if you feel able to do it.

Thank you. It has been fine having you here.

Ladies and gentlemen, you have just heard the good will ambassador from Brazil. Any time he runs out of hops, steps and jumps I think he could be a comedian on the American or Brazilian stage. He is a great example of a versatile athlete.

THE POLE VAULT - HIGH SCHOOL TO COLLEGE

By: Ralph Higgins
Oklahoma State University
With: Jim Graham

Gentlemen: I am glad to be here with you and I will try to contribute something.

Before leaving home I got out some clinic notes from past years and I ran across some notes taken at the time Warmerdam was on the program. He apologized for trying to give you something on pole vaulting. This is just about the way I feel today.

We know that no two pole vaulters are identical in what they do. This is exemplified by the two fine pole vaulters werwere fortunate enough to have this year. Jim Graham, who is 6 feet 4 and weights 185 pounds, is the NCAA champion at 15 feet 2 1/2 inches. Aubrey Dooley is 6 feet and weighs 170 pounds. Both lads have a personal best of 15 feet 5 inches. They are alike only in their accomplishments. They are different in structure, different in height, and different in the poles that they use.

The same day that Jim vaulted 15-5, young Dooley vaulted 15-5 also in the same meet. When they vaulted 15-5, it was a must. They had to do it because their most feared rival, the vaulter from the University of Oklahoma, had tied them with 15-3 1/2. It made the difference of whether we would win the meet or lose it. So they vaulted 15-5.

Graham uses a pendulum-type vault, while Dooley is an acrobatic type. Those who have seen Dooley in action are afraid that something awful is going to happen because no one else bends his pole as Dooley does. He uses a glass pole. Year before last I took him out to the West Coast to vault in the West Coast Relays. When he came down the runway and planted his pole the crowd practically screamed and they scared Dooley to death and about half scared me. As he vaults he keeps his hands apart a considerable distance, and when he rams down on the pole it makes a complete half-circle.

Some of you may have seen the pictures of Dooley's vaulting that came out of the NCAA championships. His pole makes a half-circle. The end of it, when it shoots up and straightens out, throws him on over the bar. That, along with his acrobatics, is the reason I think it may be a revolutionary trend in vaulting. We have had a lot of correspondence from various people in relation to the use of the bfiberglass pole because of Dooley's success with it.

I have been asked to speak on "Pole Vaulting, High School to the Championship Class." Suffice it to say, I am starting my 25th year at Oklahoma State University, and I have been away from high school quite a while. I can hardly go back and recall how we started. Most of the time we picked them out of gymnastic classes, and so on.

I am going to have Jim Graham tell you something about that when he comes on in a few minutes.

In speaking of pole vaulting, we know that there are some factors that we want to work on. One of these factors of success of the United States vaulters this year has been the use of the macadamized runways. It has standardized the runways so a man can set his marks and he doesn't have to be changing them as the runways are torn up. Along with the better poles that we have, our vaulting has become something that we didn't even dream of 10 years ago. At the NCAA meet the championships went at 15 feet 2 1/2 inches. The fact that the champion went at 15-2 1/2 is not important because the record is 15-9 3/4, which Gutowski set 3 years ago. The important fact is that there were so many vaulters over 14-6. There were fourteen or fifteen over that height!

In the National AAU championships four men cleared 15 feet 3 inches. Gutowski, who is the unofficial world record holder, was fifth in the meet with a vault of 15 feet.

So we find that we have greater vaulters than we have ever had. As I say, I think one of the great factors in that has been the use of the macadamized and rubberized runways that we now have. They know where their marks are going to be.

Dooley, in his Big 8 competition this year, was off on his runway and he didn't even place in our Big 8 Indoor Championships. Yet, weeks later, he vaulted 15 feet outdoors. It was a matter of timing on the runways.

But let's talk about some other factors that are important in pole vaulting.

At our school, Oklahoma State, we have had a number of vaulters down through the years. I could never get a vaulter to go 14 feet. When Graham was a freshman, and then a sophomore, we vaulted in a pit where all we had was sand to land in. After talking to Richards I got busy and built a vaulting pit which we had filled with shavings and from there on out, our vaulters began to go higher. That is one of the big factors. You men who are building pole vaulters - - especially beginning pole vaulters - - be sure you furnish them something which is conducive to their wanting to vault. Be sure that you have a soft pit.

I know, when we go on our tours, that is the first thing that the vaulters want to check: What kind of a pit are we going to have?

Vaulting has become an event taking from 3 to 6 hours of the meet time, which is something we, as track coaches, must correct.

In our recent NCAA championships, the competition began at 4:30 PM and was completed at 8:45 PM in the gathering darkness. In our NAAU championship, the competition began at 1:30 PM and was completed at 7:30 PM; 4 hours and 15 minutes and 5 hours and 40 minutes. Not even our marathoners go that long.

Development of stamina and endurance by strenous body conditioning program through the use of weight lifting, cross-country running, gymnastics and work on trampoline, along with regular track training techniques is, of course, a must.

Naturally, these are all built around the program of learning the fundamentals of vaulting such as vaulting fences, rope vaulting and pole vaulting itself. We learn by doing.

In the past the men who were wanted as speakers for the clinics were the coaches who had had champion athletes. We, the coaches, are trainers. We help the young men that we work with but they are the ones who actually get the job done. So, to that end, I am going to introduce you to Jim Graham, who was the NCAA co-champion in 1956 with Gutowski at 14-8. He made the Olympic team that year. He cleared all the vaults on his first jump up to the ones he finally missed at 14-8 1/2, and he came back after a series of misfortunes, broken wrist and dislocated ankle, and this year he reached the personal peak of 15 feet 5 inches and won the NCAA championship at 15 feet 2 1/2 inches.

In high school, Jim was the Oklahoma State Champion with the personal best of 12 feet 2 inches. I give you Jim Graham - -

MR. JAMES GRAHAM (Oklahoma State University).

I am very glad to be here and speak to you gentlemen and, I hope, future pole vaulters.

When I first learned that we were to be here and speak on high school pole vaulting to championship class Iracked my brain trying to think what it was like to vault in high school. I finally came up with a few ideas, but not too many.

I think one of the greatest problems that we have with the high school vault-

er is a lack of knowledge - - a lack of analytical knowledge of the pole vault by the coaching staff at the high school level. I know that when I was in high school I was fortunate enough to have a man coaching me who had been a champion at 14-2, Mr. Rogers, of Tulsa High School. He knew what the pole vaulter should do.

But still, as Coach Higgins said, every individual is different. You can tell a vaulter how you feel when you vault but still that individual has to experience it himself, in his own particular manner.

The high school pole vaulter generally starts out with a little calisthenic or gymnastic background. I feel that that is important, not only from the standpoint of what strength it might give him, but mainly from the standpoint of coordination.

Coach Higgins, Dooley and myself feel that it is not necessarily the strength that the vaulter has but the coordination of that strength at the proper instant that is important.

Many high school vaulters start out after going to a gymnastics class. They go out and pick up the pole and maybe they will jump 7 feet. That doesn't sound like much but I can remember the time when I was kicking the bar off at 7 feet. You have to start somewhere. From there, it is a long, hard row because each level is not only a physical barrier to the beginning vaulter, but it is a psychological barrier which must be overcome.

The beginning vaulter has considerable difficulties. We pick up literature that states some of the difficulties of the beginning vaulter but we never find any literature from the analytical standpoint that the beginning high school vaulter can understand. We have very many good books - - especially on the Mechanics of Pole Vaulting which analyzes the pole vault from the standpoint of physics and appropriating the center of gravity in relation to the pole and the speed. To a high school vaulter who has never experienced these things, I don't feel that it means anything.

So we have the problem of trying to instruct an individual to do something which he himself has never experienced. There is nothing like success to stimulate success. So, with the problems of the beginning high school vaulter we run into considerable difficulty because he has not experienced those things. I feel that the worst problem of a high school vaulter is running into his pole and pulling directly from the ground.

We had a boy in Oklahoma this last year from Oklahoma City who jumped 12-8 and, I believe, if he could have swung into his vault with smoothness, he

could have jumped 13-8. That is a high school vaulter. This individual ran completely under the pole and anyone who knows anything about pole vaulting knows we take off from a position directly under the pole. Consequently, if his timing was not perfect, he was not directly over the bar at the proper instant and he fell on the bar because he had no momentum to carry him over the bar.

This is one of the biggest problems that I have seen in high school meets. It is one thing that the high school coaches will have to work on as far as high school vaulters are concerned.

Another thing is the lack of training of the high school pole vaulter. I know when I was training for a pole vault, I just went out every day and picked up a pole and jumped until I was so pooped I couldn't run, and that was it. I didn't run. I played around with the shot and discus when I couldn't get ooff a good jump, but that was incidental.

I feel that any pole vaulter, regardless of what age or whether he is just beginning, should first run - - - run, run, run.

At Oklahoma State, Coach Higgins has Dooley and me warm up by jogging a mile. After our workout, sometimes we run quarters, alternating with 220's. We run low hurdles; we run high hurdles. Last fall we ran cross-country. The pole vault is becoming more and more not only a contest of skill but a contest of endurance.

Many times a meet will last 6 1/2 to 7 or 8 hours. The individual has to have his legs in top condition.

In the 1956 pre-Olympic test which we had in California, there were many days when we never picked up a pole. We just went out and ran. We worked up a good sweat and got our legs in top-notch condition. When the vaulter approaches the box he actually feels a good jump is his run is correct.

As Coach Higgins said, two-thirds of the vault is in the take-off and the approach. If the step is wrong, there is nothing the pole vaulter can do about it on top of the pole. He has to correct it on the runway. That is the reason why these macadamized runways have been such an asset.

Another thing in training the high school vaulter is a lack of work on his upper body. Some of the high school vaulters and high school coaches are fortunate enough to realize this situation and do considerable work in that area but, as you know, when a man approaches or attempts to raise his body vertically from a horizontal momentum, it must be done smoothly or it puts considerable stress on the back and the shoulders and so these areas have to be strengthened.

We , at Oklahoma State, feel that this is best done not by lifting heavy weights, but by lifting light weights and doing everything with speed, and also by doing considerable work on the horizontal and parallel bars, and also a little rope climbing. However, if it is done so slowly that the individual is straining to raise himself, we feel that he is just developing pure strength with no speed. We feel that rope climbing should be incorporated in these other things to instill speed. From there on, once the individual has attained strength in his back, arms and legs, it is a matter of his experiencing the different positions through which one has to go to successfully complete a good vault.

When I was a freshman at Oklahoma State all I know about pole vaulting was running down the runway, planting it and swinging over - - I mean literally swinging. I didn't push or pull. Therefore, I had a considerable amount of work to do to experience the feeling that is attained when one jumps properly. I never will forget the day when I first got the feeling of letting my head drop back, thus elevating my hips. Once a vaulter attains that feeling, he never forgets it.

Coach Higgins said something a while ago about somebody jumping at something and never knowing where the bar was. This is another thing that the high school vaulter does not do. The high school vaulter normally, in his attempt to clear the bar, keeps his head up - - forward, in fact - - and reaches for the bar with his feet, although he does not see the bar.

To see the bar the head has to drop back thus elevating the hips, and then the feet are elevated in a vertical position. Many high school vaulters approach the bar swinging to the bar, and just as the feet get over it, they drop them again.

In our attempts to correct that we tied a rag on the end of a stick and held it as high as three feet above the bar and attempted to kick the rag off the stick. It only stands to reason that if one can get his feet going in a vertical position the rest of his body is going to follow if he follows through with his pull. This is another thing we have to work on - - getting the feet up and not just reaching over the bar.

The next problem we run into in the high school vaulter is a break between the pull and the push. I feel there is no distinguishing between the pull and the push. To me, it is all one continuous motion.

The high school coach in attempting to get his vaulter to attain this, says to pull and then push. Consequently, as the high school vaulter approaches the bar he pulls and then he turns over and tries to push. When he turns over without coming through in his push he kills any momentum he has attained in his swing. Therefore, the pull and the push must be one continuous motion, executed

smoothly and at the proper instant. I will keep stressing the proper instant because, as I said before, I feel that the strength is not necessarily the primary factor in the vault. I, myself (if it came right down to a test of my strength in my arms and shoulders), probably would not stand up to many individuals in this room, but it is the utilization of that strength at the proper instant that is the secret.

Work on a trampoline helps to develop timing. It stresses this utilization at the proper instant. Too much, however, tends to take the spring out of an individual's legs. I worked on the trampoline my junior year during the fall, doing just simple exercises, but exercises that had to be executed instantaneously. This, I feel, helped considerably.

Then we run cross-country. A lot of individuals feel running a long distance takes the spring out of one's legs. I don't believe that is true if it is done properly. This going out and running flat-footed like a duck isn't going to help anyone. If, however, you do it properly, it can't help but put spring in your legs. The fall that I was running cross-country I played basketball. I had been able to jump up and hit the rim easily enough with my hand but I have never been able to "dunk" the basketball. I was tremendously surprised with the ease with which I could jog up and put the basketball through the hoop. I feel the cross-country running helped my legs and my ankles. I have bad ankles, so this running was an asset.

The part of the coach in teaching the individual involved is purely analytical, I feel. The coach has to know what he is talking about. He has to know how to tell the individual what to do. Not only that, he has to apply the basic fundamentals of pole vaulting to that individual's style.

I feel that a coach's part in teaching the pole vaulter can be largely psychological. When a pole vaulter reaches the height of 13-6, that 14-foot bar seems like it might as well be a mile high. It is necessary that the coach have the proper attitude. I have seen coaches go out there and as long as a man got over the bar, it was a good jump regardless of whether he went over upside-down or not. Then I have seen coaches, when the man makes the bar by a foot, tell the man it was a bad jump.

Coach Higgins does that. Then he tells you what it was that was wrong with it. A coach has to analyze the vault and apply it to his vaulters.

Once I reached the 14-foot level - - actually, I went from the 13-foot level to 14-8 1/2 in one season - - I feel all it was due to was the training that Coach Higgins gave us and the work on the bars and the weights and then incorporating the speed and the reactions at the proper instant.

I feel the pole vault is an art. Well, I guess any individual feels the event in his own field is an art. If he does it correctly, it is an art. I say that because the pole vaulter has to incorporate into his event a lot of the actions o that many other competitors only have to incorporate singly in their events.

For instance, the pole vaulter doesn't jog up to the bar and jump over; he has to sprint. He has to have strength, not necessarily that of the shot puter, but he has to have considerable strength. He has to have the coordination of a hurdler or high jumper. So, as I say, we consider our event a little more of an art. I guess that is a little selfish, in a way, but others may consider their event more of an art, too, so you can take that with a grain of salt.

I don't think, as far as I'm concerned, that I could go out and coach another individual to jump as I do because he just has to jump differently. I think one of the reasons for our success this past year was the competition between the two of us. We started out the season jumping nearly alike. We continued through the season, each elevating all the time; each helping the other, but never giving in to him.

At the beginning of the season our goal was to both jump 15 feet in the same meet since it had never been done in collegiate history. We felt we had the potential to do this if we would work together on it. Consequently, we made a pact between ourselves that we would help each other in any way we could, telling anything that we felt the other did wrong; how he could inprove it; what exercises he should do to improve himself, but yet, in competition, never give in to the other man. Any man wants to win. He wouldn't be out there on the track if he wasn't out there to win. No man gets in the starting block to run second. We all like to win but it is not too bad to lose if you are in the right frame of mind when you lose. So, for that reason, I feel that our success has been due to the competition between ourselves.

Another thing is the plant of the pole: The high school vaulter plants his pole too hard. He jabs it into the box. This is wrong, because this stops the pole's momentum. You drop it in as you move forward and under it.

Mr. Stealy: Jim, do you use a fiberglass pole?

Mr. Graham: I use a Gile Vaultmaster.

Mr. Higgins: Tell them what happened to you during your 14-6 in your junior year with a fiberglass pole the first time you picked one out - - the first workout.

Mr. Graham: I had just been doing general conditioning for three

weeks. I went out and picked up my fiberglass pole. He ordered one for Aubry and me, and I jumped 14-6 with no effort at all, it seemed to me. Of course, any good jump done smoothly feels like there is no effort.

Our first meet was at Kansas State University and I felt I was ready to jump 15 feet that night but, unfortunately, on the pit I fell and broke my wrist, so that ended that. I had swung too far. I was feeling really good that night and I pushed tremendously hard and I just kept going.

Mr. Dekan: I am a great believer in the take-off being right. You went from 12 feet in high school to 15 feet. Therefore, you had to move your take-off point back away from the box. Now, one of the big problems that I feel the high school coaches have is getting that point moved back. I have found just putting the marks back doesn't suffice. I think the eye adjusts to the old mark and you stretch in - - if you know what I mean?

Mr. Graham: I think I know what you mean. I have never experienced that. I automatically moved my step back. I never realized that problem existed.

Mr. Dekan: Just move your marks and it goes back.

Mr. Graham: Each year I work out a different set of steps that feel best for me for that particular season. The vault feels right to an individual or wrong at take-off. If it is in so far, it is bound to jerk him. I just let the take-off take care of itself as far as the particular spot I take off from. When I jumped 15-5 I was carrying approximately a 13-foot and 9 or 10 inch pole, so that would be an effective grip of 13-1 -- 2.

From the Floor: How long is your run?

Mr. Graham: 117 feet 9 inches, which is considerably shorter than the average individual.

From the Floor: Do you use the same grip?

Mr. Graham: I never vary my grip. That is another thing - sometimes as the bar goes up, high school boys move their hands. When you move your hands, you have to change your whole style. Your timing has to be completely changed.

Chairman Snyder: Some vaulters have two grips -- one they use for warmups.

Mr. Graham: I will take a swing in the box with a low grip, but I never even take a practice jump without the high grip.

THE FIFTEEN FOOT VAULT

By: Cornelius Warmerdam
Fresno State College

In this analysis many of the features of Laz's vault are also true of the other two vaulters, but since his is the first vault in the series it will be covered in more detail. To avoid needless repetition these details are not repeated for Cooper and Richards, and only the features that are different are pointed out. All sequences are numbered from left to right.

Illustration 1 shows Laz in fine take-off form with his hands fairly close, elbows flexed to take care of the shock of the pole hitting the box. His left foot is planted directly under his hands, at right angles to the ground, or more probably slightly behind this point.

Illustrations 2-6 show a long swing prior to the pull-up. This phase of the vault is probably the strongest feature of Laz's vaulting. His arms have extended from a flexed position to an extended position, and in these five illustrations are doingnothingbut hanging on to the pole and allowing his body to swing forward freely to take full advantage of the velocity developed on the approach. The third picture is an example of a delayed period where Laz's hands and legs are behind the rest of his body with his back slightly arched to get the greatest advantage of the catapult action which may be obtained by a long swing. Illustrations 4, 5 and 6 show that his knees have started to lift, but there is still no pull-up by the arms. In Illustration 6 Laz's knees are about shoulder high where they should be before a pull-up is started. Many inexperienced vaulters start their pull-up before this point is reached and thus kill part of their swing.

Illustration 7 shows the beginning of two phases of the vault - - the pull-up and turn. These two actions are almost simultaneous. Laz's knees in this illustration have come back toward the pole to provide for more efficient lifting since it becomes more difficult to lift the body as it moves away from the pole.

In Illustration 8 the pull-up has been completed with the body still moving upward and still turning.

Illustrations 9 and 10 show the completion of the turn with the body now in position to be pushed upward by the arms.

Illustrations 11-15. Several factors show up in the last five illustrations of this series. It would appear that the standards are at least two feet beyond the take-off box, which is very unusual at advanced heights. Most vaulters ad-

just the standards away from the box at lower heights, but pull them back toward the runway as the bar goes up. The purpose of this is to allow room for a long swing. On lower heights the bar might be displaced during this action. As the bar is raised, there is more space beneath and, therefore, less danger of a miss during the swing. The angle of Laz's body in relation to the pole in Illustration 12 is not a good one. Notice that his left leg has already reached for the bar and has started downward. Thus any push-up by the arms at this point would only result in raising the chest and shoulders and not the entire body. For a perfect push-up action it is our belief that the legs and body must not start downward until the pushing action has been completed, and the hand start to release the pole. If Laz had obtained a more vertical angle, and then had kept his legs elevated until the push-up was completed he would, no doubt, have come down on the cross bar and missed the attempt. But if he had pulled the standards nearer the box it would have had the effect of keeping his body more nearly vertical on the pull-up and turn, and would have resulted in a far more effective push-up. In Illustrations 14 and 15 Laz shows good clearance technique with his elbows out and away from the bar, and his body arched to avoid the bar. Many coaches advise their vaulters to turn their thumbs in at this point. This forces the elbows out and they are less apt to touch the bar.

COOPER

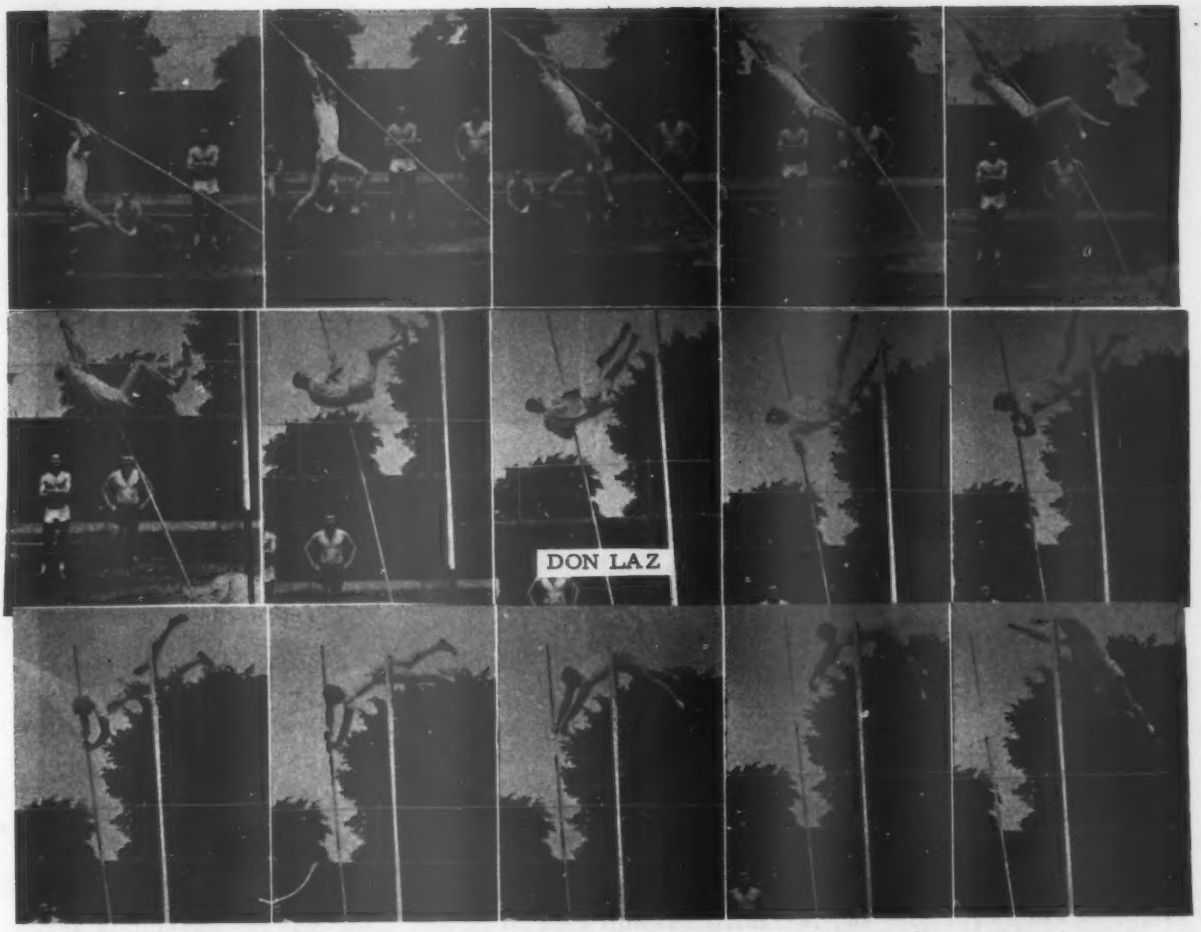
The sequence of Don Cooper shows his actual 15 foot, 1/8 inch vault at the Kansas Relays.

Illustration 1. On his plant Cooper displays a difference in technique from Laz and Richards. His arms and elbows are directly alongside the pole instead of out away from it. This sometimes contributes to a lack of balance on the take-off. Cooper's right knee shows a powerful stride in air action and an excellent lead for a good swing.

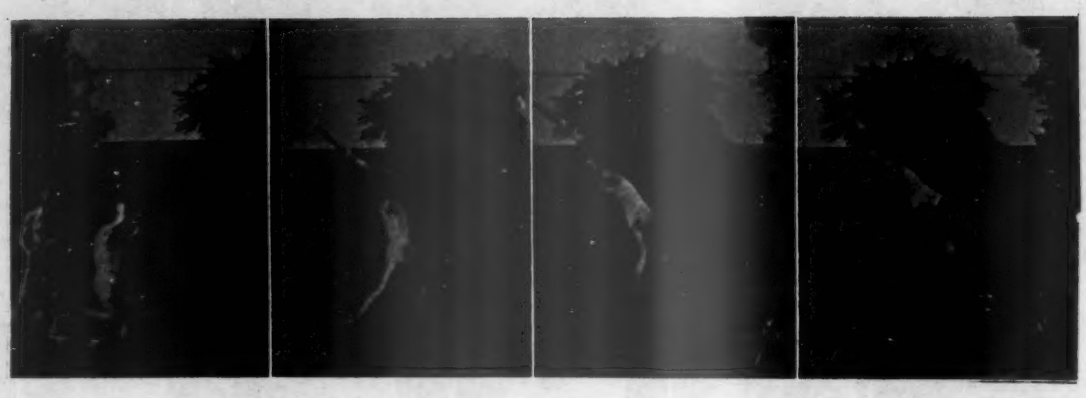
Illustration 2 shows action in the middle of the swing where Cooper merely hangs on to the pole waiting for his body to swing farther forward before starting to pull.

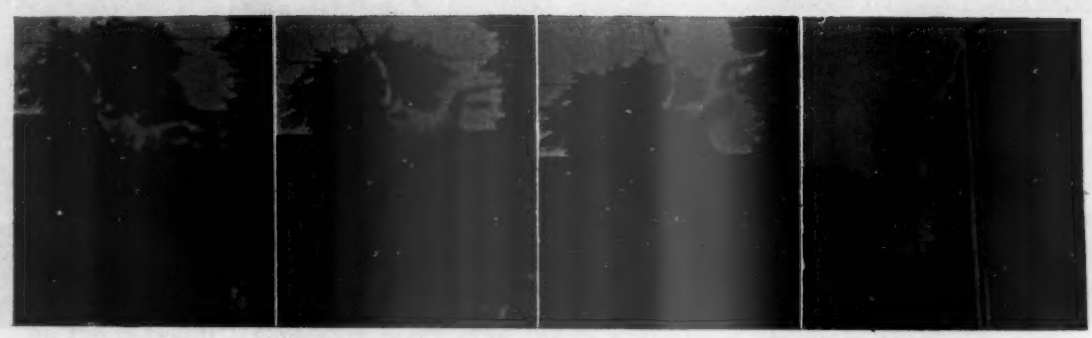
Illustration 3. This illustration, we believe, shows the key to the success of this particular vault. Notice the terrific concentration and powerful muscular action of the arms as Cooper starts his pull-up and turn. His body is well-balanced and in excellent position to pull. His knees have come well back toward the pole, thus curling his body around the pole in a compact position beautifully adapted to get the most out of the pull of his arms.

Illustration 4. The turn has not been completed in this illustration and, in fact, is not completed during the entire vault. This is why Cooper moves toward the left standard as he nears the bar. A lack of balance on the take-off


DON LAZ

COOPER





RICHARDS

could also have contributed to this. In this analysis, without seeing the actual vault, it would seem to us that Cooper must have had a long swing and a terrific pull-up which catapulted his body up very fast. If this were not the case, he could never have cleared the bar from the position of his body as shown in Illustration 4. His push-up has started, but since the pole is still leaning backward, he has no base to push from, and can only push the pole away. Therefore, he is getting no help at all from this action but still achieves the height needed to clear. This could only mean that he was still moving upward rapidly as a result of previous action, namely, swing and pull-up. Had he been able to bring his pole to a vertical position and pushed up instead of away, he would, no doubt, have cleared the bar by a far greater margin.

RICHARDS

Richards shows very fine form throughout this series. Possibly his left hand could have been shifted closer to the right on his plant shown in Illustration 2. His take-off foot appears to be farther forward in relation to his hands hands than Laz's. This would mean a shorter swing by Richards, all other things being equal. His swing is much like that of Laz, but he does not start tucking his knees as soon, and waits until he has swung well past the pole. The big difference between Richards and the other two vaulters becomes apparent from Illustrations 10, 11 and 12. His body angle is much more vertical than either of the others and in Illustration 11 he shows how effective a good push-up may be when the body is in this position. All of Richard's push is directed against a steady base and he is moving his entire body upward. His right leg is flexed back toward the runway to help keep his body upright. The pole is in his right shoulder, and the turn has almost been completed. Richards has placed the standards so that the bar is directly over the take-off box, far different from the standards set for Laz. His swift rise upward (Illustrations 9 to 11) shows a great deal of power and indicates that he can handle the weight of his body easily with his shoulders and arms. This is an absolute necessity when championship heights are involved.

In Illustration 12 the turn has been completed and Richard's body is in a beautiful clearance position. His legs have started downward but his hands have already released the pole. The balance of the series shows the final phase of the vault. Richards, in this series, used a one-two release with his right hand on the pole well after his left hand released. Laz's release was almost simultaneous. The fact that Richard's hands were not closer together explains somewhat his release since the lower the left hand grips the pole, the sooner it must release the pole.

CONCLUSION

In conclusion we can only summarize the form of the vaulters on this one particular jump as shown in these sequences. All vaulters have good jumps and poor ones, and these pictures may not be indicative of their true form. Also, since all individuals are different in build and capacity they cannot be expected to perform exactly alike.

As shown in these illustrations, however, we believe it may safely be said that if either Cooper or Laz had the form and techique displayed by Richards they would be achieving the same heights or greater heights with the same consistency Richards has shown in the indoor meets this season.

In order for Laz to obtain a more effective finish it would be necessary for him to move the standards in toward the runway. This would result in a more vertical vault and he could then capitalize on his tremendous swing and pull-up by keeping his body moving upward instead of outward. Sixteen feet would then be well within his reach since he has already achieved 15 feet, 3 inches by depending almost entirely on his swing and pull-up.

Cooper's two greatest difficulties lie in his failure to bring his pole to a vertical position, plus an inadequate turn. He may be holding too high on the pole for his take-off velocity on this particular jump since speed and hand hold on the pole have high correlation. Apparently Cooper has plenty of shoulder strength and his take-off was fairly smooth. His potential as a 15 foot plus vaulter is very great, and as he improves, his technique should continue to improve his maximum heights.

Richards shows superiority in the finish and has overall fine form. Perhaps his swing is not as pronounced as that of the other two boys. Richards will, no doubt, continue to be the nation's best and most consistent vaulter for the next few years, and has reached a point where he may seriously threaten the existing records in nearly every meet.

This article is unique in that it presents an analysis of the form of the three fifteen foot vaulters by the incomparable Cornelius Warmerdam, who was the first vaulter to clear the magic height, and subsequently cleared it 42 additional times. Pictured at the bottom is Bob Richards, the second man in history to clear fifteen feet. In the middle is Don Cooper, who became the first collegian to surpass the figure, only to have his record broken two hours later by Don Laz, who is shown in the top sequence.

1 2 3

4 5 6 7

Mechanics of the Western Roll

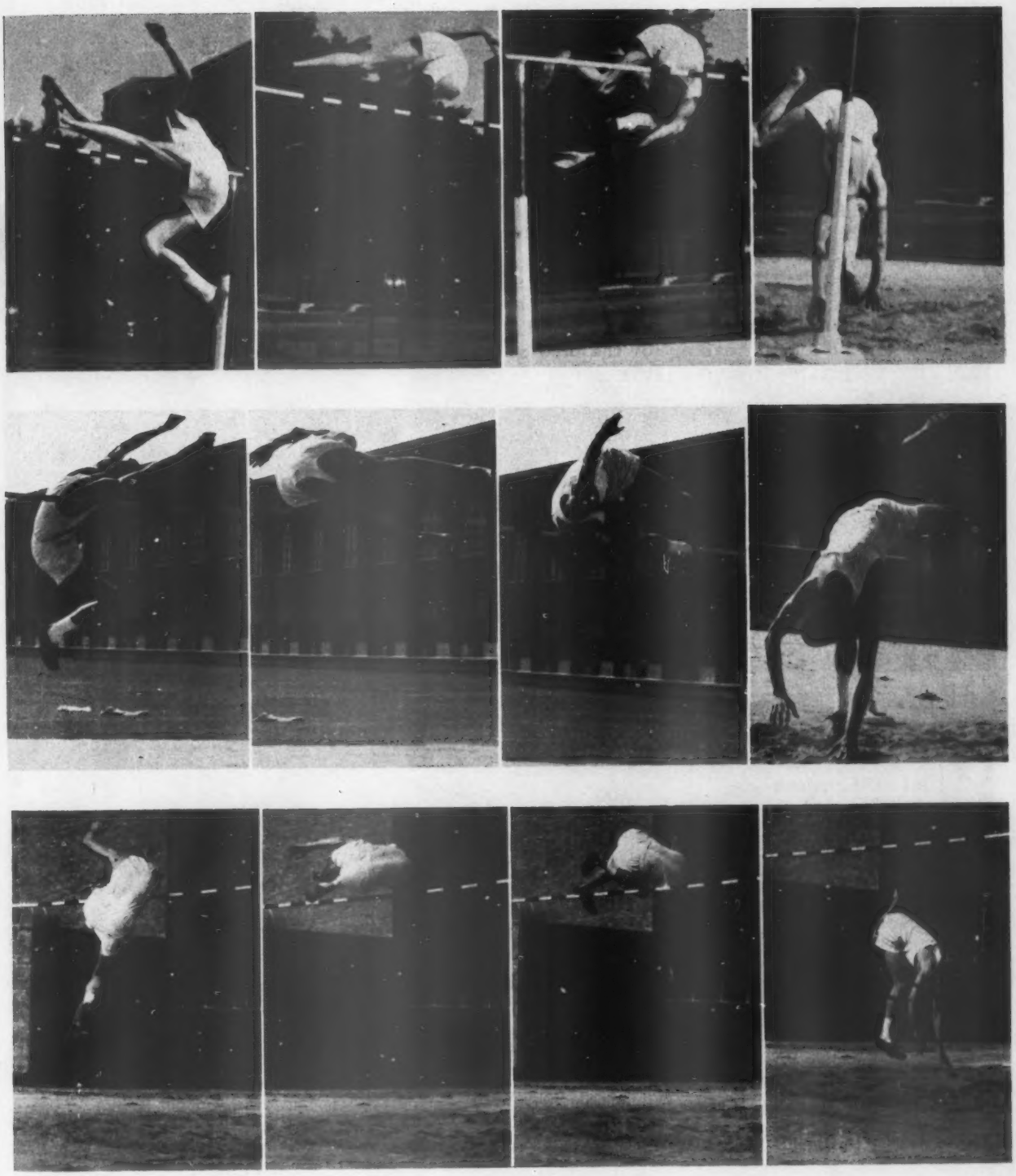
Captions by DON CANHAM, Univ. of Michigan

The picture sequences show Mark Booth, University of Michigan high jumper. He is 5 feet, 8 inches tall and has cleared 6 feet, 8 inches — a foot over his head. Booth is using a Western roll and incorporating a dive into his jump. This combination is necessary because of his small stature. The orthodox Western roll would not involve as much of a dive as Booth is using. He is starting the dive by dropping his head to the right — following a vertical take-off. Regardless of style, high jumpers use one check mark at the start of their run, and usually take six or eight strides to the bar. The run should increase slightly in speed as the athlete approaches the take-off. The most important thing in any approach is that it be uniform, relaxed, and comfortable for the athlete. While many jumpers have used the straddle in recent years, it must be remembered that many of our past world record holders and champions have used the Western roll. Without question, the Western roll is more practical for the average high school or beginning high jumper.

It will be noticed in Illustration 1 that Booth has planted his take-off foot, heel first. In addition, he has a long last stride due to the build-up in speed. This long last stride is vital because it aids the athlete in blocking or checking his forward momentum for the take-off, in order to convert the forward motion into vertical motion. As shown in Illustration 2, the jumper is swinging his outside or lead leg parallel to the crossbar. In addition, he is hunching his inside shoulder so that he is rising vertically off the ground. Notice in Illustration 3 how Booth has incorporated his arm swing with a pendulum action of his lead leg. He has received tremendous lift from the vigorous swing of the lead leg and some help from the arm swing. At this point (Illustration 4), the dive becomes evident because Booth is leading his jump with his head. In addition, he is letting his lead leg continue to carry his center of gravity higher into the air. Jumpers using a dive must remember that the head does not drop until after a vertical take-off has been made. As shown in Illustration 5, it is evident that the jumper is completely relaxed on top of the bar, and has dropped his inside arm down toward the pit to assist the rotation around the bar. Notice also that he is still leading his jump with his head because his head is well below his hips. In landing, the Western roll jumper touches the pit with his inside or take-off foot and hands, and then rolls over onto his side (Illustration 6).

This picture sequence shows an actual jump at 6 feet, 6 inches. Booth begins to settle in preparation for a foot plant and take-off. Illustration 2 shows Booth rising vertically from the ground, hunching his inside shoulder, and starting his free leg and arm swing. The jumper, after take-off, drops his head forward to simulate a dive at the top of the jump (Illustration 3). Illustration 4 shows how Booth has drawn his inside or take-off foot up tight against his lead leg. In addition, notice his inside arm begin to drop toward the pit to help start him down. A perfect example of the advantage of the dive Western roll is shown in Illustration 5. Booth's head and shoulders are starting down toward the pit, while his hips are still rising, giving him a wrap-around effect on the bar. Thus, he is able to jump slightly higher by using a dive (with the same center of gravity) than he could by using the Western roll without a dive. Illustration 6 shows Booth preparing for landing. Both of his hands and his inside leg start down toward the pit. Notice how far below his hips he has managed to get his head and shoulder following his dive over the bar.

Demonstrated by MARK BOOTH



TIPS FOR HIGH JUMPERS

By: W. Harold O'Connor
Concord, Massachusetts

Most boys who've never had any high jump instructions are likely to race at the bar as though afraid it will topple off before they can get there, and then try to clear it with the old scissors kick.

A few boys will run from the center and try to propel their entire bodies straight over the bar. Some will even sprint to the bar and try a more or less modified dive.

Very few boys will set up any sort of take-off mark, and you will have to teach them how to do it. But the real job comes in convincing the beginner that he isn't a sprint heading for the tape or a broad jumper gathering momentum for the propulsion over the pit.

The boy must be convinced that a speedy approach is more often a handicap than a help. I usually lead the neophyte to the bar and, placing my finger and thumb across the inch or so of the bar's width, I ask him just how much speed he would need to carry his body across that space if the bar were on the ground a couple of feet from his take-off.

I then emphasize that he doesn't have to drive his body any farther horizonatlly when the bar is suspended in midair. It's still the same width. His job is to lift his body above the bar. His momentum will then take him across that inch of wood or metal, provided he moves his arms, legs, and hips out of the way.

Because the coordination of motions above the bar depends upon split-second timing, the jumper must give himself every possible instant of reserve so that he can roll or lift his body away before his forward motion brings him into the crossbar.

The boy who sprints in at full speed is driving his body forward so fast that he'll often hit the bar before his body has had a chance to get above it. Assuming that you're steaching him either the stomach roll or the regular Western roll, he'll strike the bar before he can roll or kick his legs to get them out of the way.

Many of our country's best jumpers seem almost to hang in the air above the bar. It's obvious that they concentrate upon upward rather than forward mo-

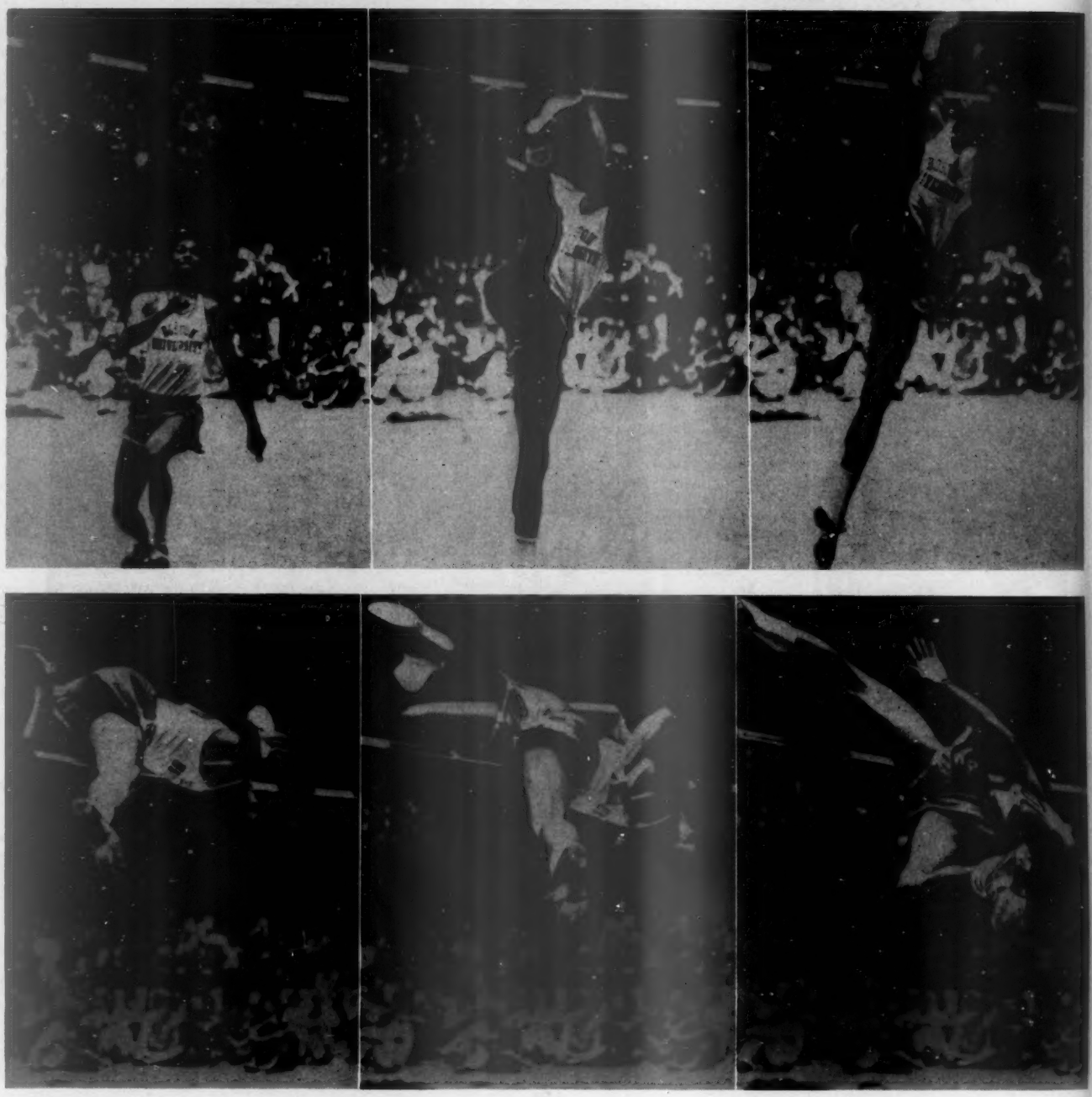
tion. I like to encourage a boy to jump up beside the bar rather than across it. If he can concentrate on that, he'll allow himself more time for the necessary body motions above the bar itself.

Where your jumper really needs to save time is in that too brief instant that he hangs in space above the bar, not in his approach.

One of the best ways to teach a boy the unimportance of a speedy approach is to have him stand just a few yards away from the standards and practice two-step jumping. You can't beat this as a means of teaching him to spring upward rather than forward and to coordinate body motions above the bar. Once he's grasped the significance of this, you can let him go back to his regular run of four or five strides.

PHIL REAVIS

World-Record Breaking High Jump



by John Thomas

Photos by Don Rice, N. Y. Herald Tribune

Another problem the coach faces in his work with beginners is that of deciding which style to teach the boy who starts as a scissors jumper. The inadvisability of letting him continue with the scissors is quite evident to most coaches. All you have to do is watch the boy's head.

Actually, a boy can jump only as high as he can lift his head on his upward spring. Once his head clears, he can lift, roll, or kick to get the rest of his body over. In the scissors jump, the boy can't lay out. He must sit over the bar momentarily while trying to lift one leg over, then the other. To do this, he must lift his entire upper torso straight up above the bar. Obviously, this wastes a lot of bounce.

For this reason, practically every coach subscribes to some type of roll. Since most of our best jumpers today are using the stomach roll, the majority of high school coaches are teaching this form to their prospects. I doubt the wisdom of this practice. How wise it is to have all our jumpers do the stomach roll, or the Western roll, or some pet variation of either?

Most good football coaches agree that it's a mistake to build a specific type of offense without the material to make it go. We should study the prospective high jumper just as closely before deciding which style to teach him.

For many reasons, I'd like to have all my jumpers do the stomach roll. I'm convinced that in most ways it's the best style extant. But not for every jumper! And not in every way.

For conservation of energy and ease in landing, the straight Western roll has much in its favor. For the ultimate heights, I think the stomach roll with the lift of the trailing leg rather than the kick of it is the answer.

I had a lot of fun and learned a lot in camp last summer teaching about 20 boys of all sizes and ages to high jump. Some I let stay with the scissors jump; some I taught the straight Western; some I taught the stomach roll. Some I had run from the left; others I had run from the right.

With only a field day at the end of the camp season to point for, there was no great urgency in the instruction. All the boys were beginners and all were willing to try whatever I suggested.

I immediately discovered that every boy had to be taught to decelerate his approach. I found that some boys who could do nothing at all with the stomach roll could grasp the Western roll with ease, and vice versa. I was a little surprised to learn that a couple of the prospects who wanted to approach from the left were much better coming in from the right.

In most cases, the take-off foot that the boys wanted to use was the correct one for them, but I was interested to discover two exceptions. These boys did far better jumping off the right foot even when they wanted to go off the left. One tall boy who got nowhere trying a stomach roll from either side and who then wanted to use a Western roll from the left, won the field day competition with a Western off his right foot.

The whole experiment taught me to be more cautious about concentrating on any one style of jump to the exclusion of all others. From now on, I'm being much more careful in my analysis of beginning high jumpers.

Another point I noticed was that boys who like to scissor from about a 30° angle can be taught to stomach roll far easier than boys who want to approach from the center and jump straight over the bar. The latter type grasps the straight Western roll with its left leg tuck-under much more easily than the stomach roll.

Both at school and at camp I learned, too, that some boys can't master the stomach roll because they can't stand the toss they get from the landing in the pit. They do much better with the Western because they can land on the take-off foot and their hands.

When a boy begins to master form, he becomes very conscious of his run to the take-off. With some of my jumpers I've found it helpful to take actual measurements from the take-off point to his first mark.

Since jumping pits present many different types of approaches, varying from slight inclines to down grades, your jumper can help himself by observing broad-jump procedure in taking actual measurements of his run. Thus, whether at home or away he can get his correct distance without guessing.

After careful observation last year, I was able to pick out the exact spot of take-off for my senior high jumper when he was at his best. We even went so far as to measure the distance from the bar and the approximate angle of approach to get him into that take-off position consistently.

That helped his confidence and seemed to help his jumping as a whole. During this study, we also discovered that we were trying to get him in too close to the bar on his take-off. With the Western roll, the close take-off is helpful but a tall boy seems to need more space in the stomach roll.

Through close study, we observed that the distance from the bar tended to vary somewhat in indoor and outdoor jumping. The amount of bounce a boy got from the boards contrasted with what he got from the ground, so that we had to

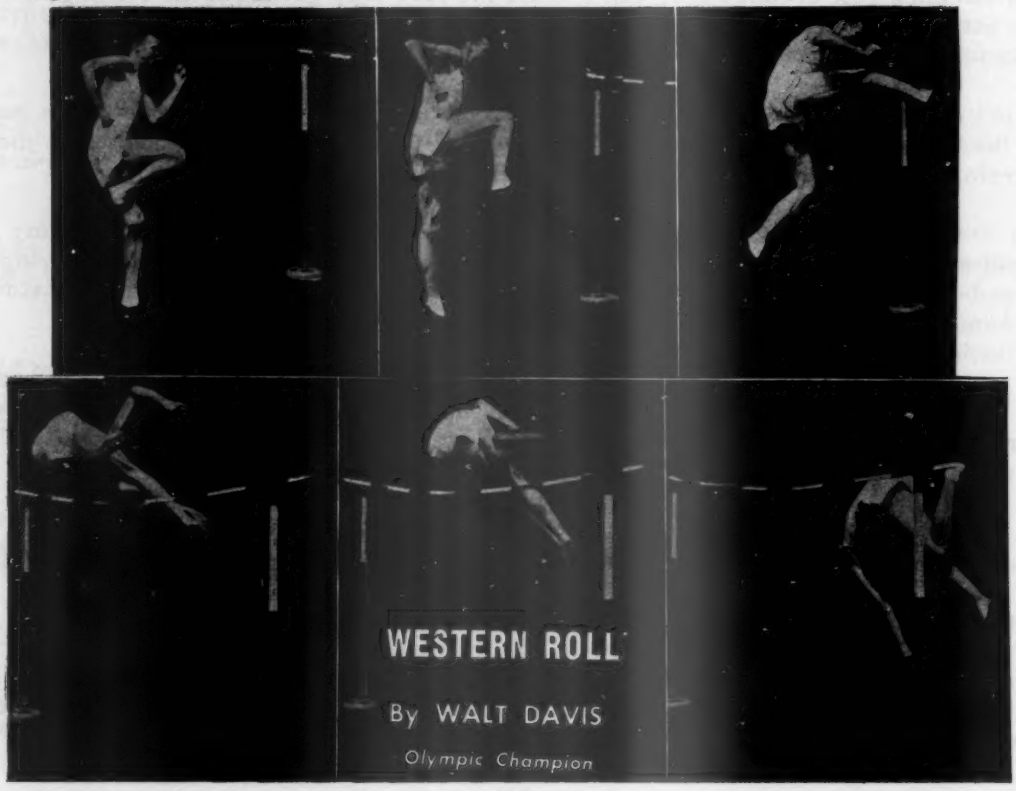
move the take-off spot several inches for some jumpers.

Some boys are quite concerned about what to do with the arms when the body is above the bar. If you check the actions of many topnotch jumpers, you'll notice that their arm carry varies tremendously.

My own belief is that the coach shouldn't worry the boy about arm position unless he's grabbing at the bar or hitting it with his arms. Don't make him think about the arm position at all unless there's a real need to do so. Tell him merely to get his arms out of the way in whatever way he can.

Finally, I'm convinced that in using the stomach roll, a boy can add extra inches to his jump by concentrating upon lifting his trailing leg away from the bar instead of kicking it in the manner of an inverted scissors jump.

If he kicks the leg, he must drop his knee to achieve the high kick and at that point the knee most often will hit the bar. A lift, however, takes the leg away, though it does bring the jumper down on his back. If he can take the bump, he'll get a better jump.



AN ATHLETE'S VIEWS ON DISCUS THROWING

By: Dick Cochran
University of Missouri

I have made a study of the discus because it is a sport I enjoy. It is also one of the few I can do well. I started throwing in the seventh grade. As you can probably can tell, I was large for my age with long arms and long torso. At that age a boy is pretty clumsy and it is hard to move around in an 8-foot circle. I had Mel Sheehan and Phil Bruskin as my coaches. They were of great help in getting me started right.

I use one and three-quarters turns and start facing the rear of the circle. I started with that in high school.

When I went to high school they kept me with the same style. The only thing, I believe, that was ever changed was the position of my feet and the way I held my hand on the discus. I did use a talon grip with all five fingers spread. Now I use two fingers together, with a wide thumb. Most discus throwers keep the thumb in, but I like the wide thumb.

I used to throw with my feet well spread and the weight over both feet. I found that with my size and not too much speed, however, the closer I get my feet, the quicker I can get around. I can get on my left foot, get off of it and get around much quicker with my narrower stance. In my estimation, the use of the left leg is of great importance. When you come around after the spin, it has to be shot in the ground hard. You see a lot of throwers who are off of the left leg, or don't throw into it very hard. When I throw, the left leg is planted, and instead of going up over it, I throw around it. Some people don't agree with that. They think you should put it in the ground and throw right over it. I have managed to work enough so that I know about where my left foot is going to hit. It doesn't hit straight in front of me. I hit slightly in the bucket. A lot of coaches say it is bad because I hit in the bucket and open up, but I just can't feel comfortable any other way.

Maybe some of you here don't believe in weight training. I am not going to try to convince you but I would like to cite myself as an example. When I went to college as a freshman my best distance was 161. That was purely on form, not strength. I had never lifted a weight. My freshman distance was 165 which was done purely on technique - - no strength, just technique. My best distance was 167 after two months' time. I just gained two feet, and that wasn't much improvement.

FORTUNE GORDIEN

Last year I started lifting weights. I have gone from 167 feet to 183 feet. I am a consistent 180 foot thrower. I don't have to strain to throw. My bad throws go 175 or 176 feet but my good throws only go 183 feet. On a very good throw I can blast it out to 190 feet. I have thrown 190 on occasion but they are very few and far between. I credit most of this improvement to the use of weights.

You might be interested in some of my exercises. I don't use the same ones Al Oerter does. He is quite strong; very agile in the circle. He would make a good hammer thrower. My main exercise is to lay on an inclined or flat bench with dumbbells and do dumbbell raises. The more you can stretch the chest muscles, the better off you are. All your power comes from the long drag. Many discus throwers have a short drag. When they start to spin this right arm keeps creeping up until the arc they are going to pull through is very short. I like to let the discus hand back as far as possible so I get a long pull.

If I could get my arm clear back behind me, that means three feet, and three feet in the circle means a lost more distance.

Chairman Snyder: Looking out of your right eye, you can still see the discus around in back of you?

Mr. Cochran: Yes, you see many discus throwers when they get around, are looking forward. I like to keep my head and eyes back, too. If your head is back it helps you slam the hip into it and up, and that hip, regardless of what people say, it is one of the most important parts of discus throwing. If you don't throw with your hip, you throw will all arm and shoulder. You just don't have enough strength in the arm and shoulder to throw it 185 and 190 feet. You have to put your hip in it.

Mr. Werner: How do you put your hip in it?

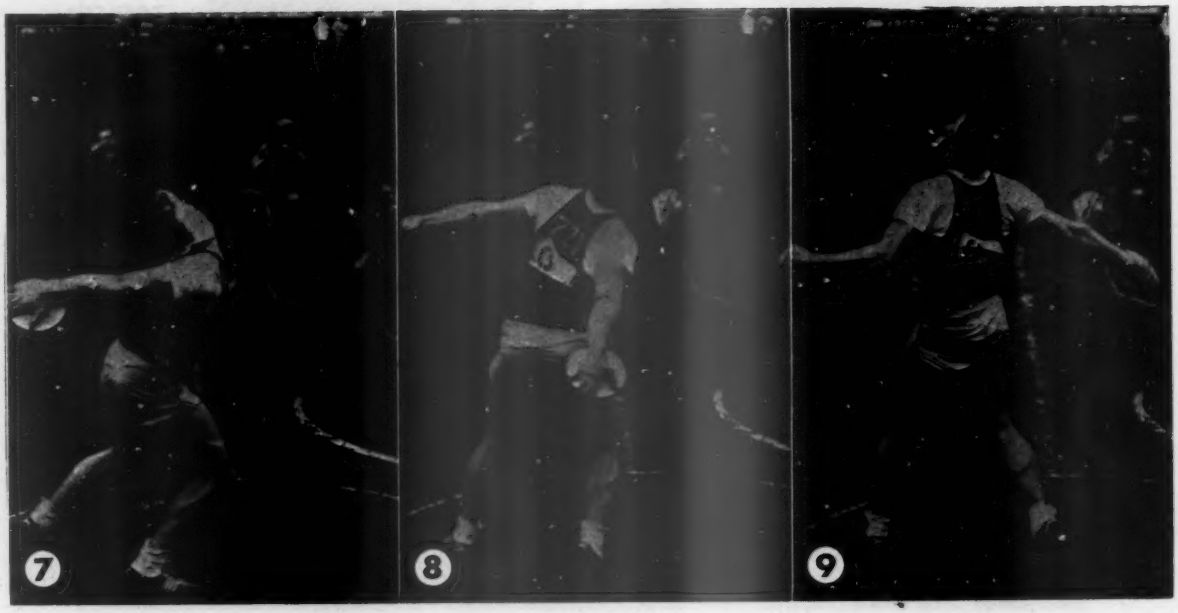
Mr. Cochran: You lead the pull with the hip drive, then comes the arm pull.

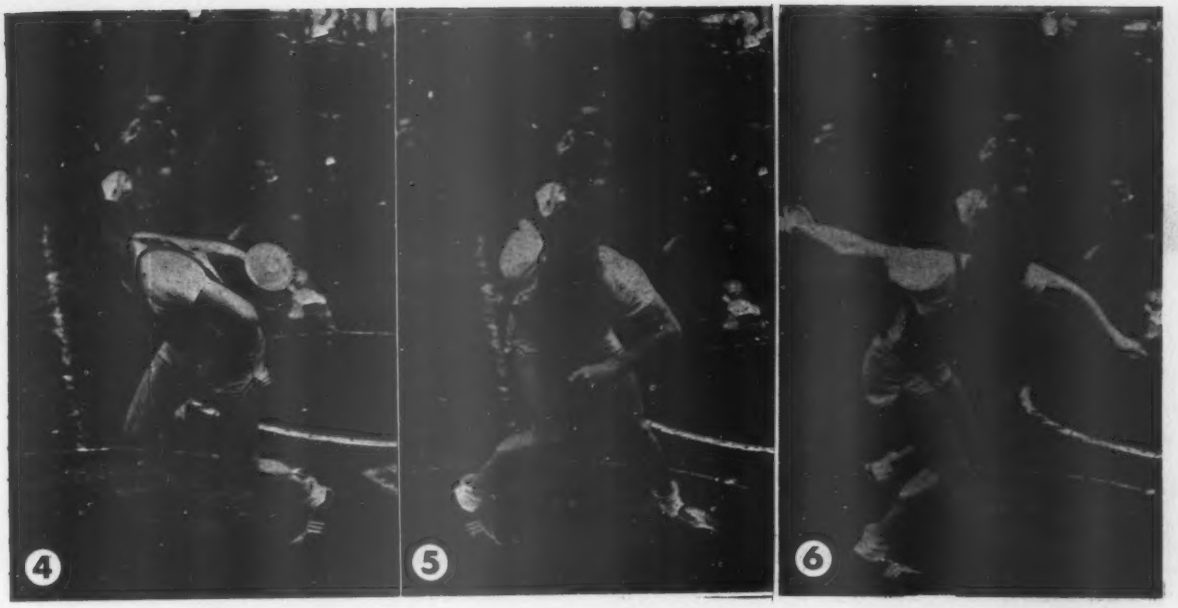
Mr. Willing: How about your head and eyes during the turn?

Mr. Cochran: I stand with my feet shoulder wide. I start facing toward the back and come around, and my eyes stay level. If your eyes go up or down, that is the way your body is going to go.

I feel that as long as you can keep the shoulders level all the way around the circle, then you can throw straight out.

AL OERTER

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Mr. John W. Morriss (University of Houston, Houston, Texas):

How can you keep a discus thrower from throwing over the discus. A lot of discus throwers will loop their arm down at the release.

Mr. Cochran: They are carrying the arm too high. Many discus throwers will carry the arm down here below the belt. Others above the belt. A lot of times, just at the end of the throw they will pull the left shoulder down and throw over the discus. Try to get them to keep their eyes straight ahead at all times and just follow one imaginary line all the way around. The stadium is just about eye level. I just followed that all the way around when I turn.

From the Floor: I noticed at Illinois they use a steel ball on a chain for the arm drag. Do you do that?

Mr. Cochran: No. I feel that it knocks your timing off, just like in the hammer. I was talking with William James about the hammer. I thought if you took it and put eighteen pounds on it, you could use it, but it clouds up your timing.

I have a heavy-weighted discus. It weighs about seven pounds, but I don't use it to spin with and I can't get a good throw by snapping it because it is so heavy.

From the Floor: How can you encourage arm drag? Suppose you have a boy who refuses to drag his arm - - what can you do to get him to drag his arm?

Mr. Cochran: Does he spin fast?

From the Floor: Yes.

Mr. Cochran: Slow him down. If your discus thrower spins fast, see if you can get him to spin slow and relax the arm - - that is the main thing.

From the Floor: Tell us about acceleration and deceleration, will you?

Mr. Cochran: Don't start out and go the same speed all the time or don't slow down. If you watch the hammer it is very slow and as you move around, then you really start moving. At the end, you should be at maximum speed. You should be going as fast as you possibly can with control. It is a build-up of speed.

THE SHOT PUT

Panel: Bill Nieder
Dave Davis
Chic Werner

BILL NIEDER: There are various forms, from Parry O'Brien to Dave Davis and Dallas Long. I will give you a quick demonstration of how I throw. Everybody starts out the same way - - 180 degrees, facing the opposite direction of the way you are going to throw. Have the shot resting comfortably on your neck, your arm straight up in the air in a relaxed position. Wait until you feel even more relaxed. Bend quick with your left leg straight out and try to hit with your body over your right leg in a cocked position.

A lot of shot-putters hit in the position which they really can't get their body into and just give a short thrust with their arm - - they can't extend all the way. One of my chief faults is I throw my left leg in the bucket. O'Brien, Long and Davis throw it directly across. I have been told a lot of times that if I could throw straight on, I could throw further. I have hit straight onto the board and I use about three feet so what is good for them is not necessarily good for me.

DAVE DAVIS: I have a question on the starting position. Some shot-putters like to start with a straight foot toward the rear of the circle like this, and some seem to carry with a 45 degree angle. What do you think about that?

BILL NIEDER: Well, if they start straight back they have to hit at a 45 degree a angle on the first hop, so why not start that way anyway? You can get a little more speed if you start at a little angle. You can go off the side of your foot rather than over the heel.

CHAIRMAN SNYDER: Would that tend to throw you in a bucket a little bit or not?

BILL NIEDER: Not if you keep your shoulders and hips coming right across in a closed position.

O'Brien holds his arm out to the side to keep closed up. As he goes across the ring he will hit and his arm will come down under. He is still hitting at 45 degrees with the right foot. I don't know why he doesn't start there to begin with. He is coming down at the finish. Yet he says he gets more drive that way.

The new method of throwing now makes a shot go further, I think, because you have a longer push.

PARRY O'BRIEN

CHIC WERNER: Bill, what about this bugaboo of starting out and landing in a perfect position, but before you can start your put with your arm or leg you have passed the closed position? Can you demonstrate what I mean?

BILL NIEDER: Well, here, we will say, is a toe board. A lot of people go and hit too close in to it and they can't extend themselves because they are too close in the board. It is better to have a relaxed position. The shot put circle is seven foot. What Chic is saying is they hit within a two-foot radius of the board. You can't get your drive all the way out.

CHIC WERNER: I think this is the most common error - - they will land in a perfect position but before they can start a put leg or arm they have slid over the left leg too soon.

BILL NIEDER: You have to stay over your right leg.

CHIC WERNER: What they do is slide past that bent knee.

BILL NIEDER: That is because they try to speed it up too quickly. That is one of my faults.

CHIC WERNER: How would you suggest that we remedy that?

BILL NIEDER: Slow down your form and look directly to the rear until after your feet are firmly planted on the ground.

DAVE DAVIS: I would like to say something about that. This pertains to your other weight events, too - - discus and hammer. I think the real gist of the thing to to have controlled acceleration. A lot of fellows start out very fast and sacrifice position for their speed. I have had trouble this year. I started off a little too fast. I would lose my position.

Now I have slowed down a little bit. I think it is a gradual build-up, like in the hammer or any other event.

BILL NIEDER: I even vary my weight routine from that of Dallas Long and Dave Davis. They believe in doing a lot of presses. I don't do any presses except for the advanced presses.

CHAIRMAN SNYDER: Bill, I would like to have you do something. Will you follow the action of the put from the front of the circle? Just what set of muscles are used - your foot and calf, or what it is - - and follow that action up until the shot has left your hand.

BILL NIEDER: After you get the shot in a comfortable position on your neck, bend

over. I kick with my left leg and drive off my right hip and hit with a 45 degree angle from my right foot again. My left leg is about a quarter off the board end from the left of the toeboard. At that time I concentrate on driving my left elbow as hard as I can to the rear, opening up. Then I try to get the final snap on the end.

CHAIRMAN SNYDER: We hear about the "lift". Where does it come from?

BILL NIEDER: It comes from your right leg. You are over your right leg. I am pulling and lifting at the same time.

When O'Brien and Long hit in this position rather than throw their left elbow, they pull it down and come over the top, in this fashion. I think they throw the shot about an angle of 38 or 40 degrees. I throw more of a line drive. I feel I get more power coming straight across than I can up in the air.

MR. CALISCH: I noticed from that position some of your better puts seem to get off too soon; too flat. I saw you get several out in that direction but they would have gone a lot further if you had more lift.

DAVE DAVIS: I am not getting in position to really lift up. My legs are too spread out and maybe I am going a little bit too fast. The last few meets the reason I have come up is because I have slowed down in starting to get that lift. I am starting to drive out instead of up. One of the important points is the leg lift.

MR. CALISCH: That is what I wanted to ask about. Do you constantly emphasize the lift?

DAVE DAVIS: I don't think of the leg driving up. I think of just reaching in the air. But, thinking of that, I automatically lift my legs. It works out pretty well.

CHAIRMAN SNYDER: Why don't you demonstrate yours, Dave?

DAVE DAVIS: It is about the same. I have been starting with my leg going straight back. Starting at Boulder I decided to change my leg and it seems to be getting into position better as I go across. Right now, I am thinking of the leg lift. That is one of my major faults. I don't get enough lift or hit. The tendency is to put the shot straight out, and that is bad.

I try to square my body around (this is a good thing for balance), and I use a spot. All your discus throwers and shot putters do. About twenty feet behind me I pick out a point and I keep looking at it as I start my movement. That keeps my head erect and my balance point. My arm is relaxed. Try to keep relaxed here. When I am ready to go I lift my left foot a little bit, in order to get me going quickly. I should get a little bit lower but I can't seem to get lower and get the coordination needed to come out of it.

I am very relaxed. I try to stay very relaxed because the more relaxed you are before you put the ball, the better it is. It is not strength, it is the snap. I try to stay very relaxed. I am coming very slow here. O'Brien comes up very hard at this point, but I can't seem to get together if I do that, so I am coming up very slowly, very slowly until right about here, and then, right here is my strong point (demonstrating). I just jump and try to get all the snap of the wrist and forearm into it. That is when I get my good puts, when I get a lot of snap. I don't get enough leg lift or drive from the initial position.

Although I have tried to think about that, if I work on that, the wrist snap and all the rest seem to leave me. I don't think about that too much. I just think about the finish.

From the Floor: Nieder has his elbow in. The way you are demonstrating it, you have yours out.

DAVE DAVIS: I don't mean to have it that far out. If you do, you will lose it and you won't get the lift.

From the Floor: Bill, you don't have your elbow out that far from your body, do you?

BILL NIEDER: No, I try to hold it in close. I can get more power.

From the Floor: If he brought his elbow in, would it help him?

BILL NIEDER: I think it would. A lot of times I think his elbow is getting out and falling off.

From the Floor: We have kids who loop all the time. How do you work on that?

BILL NIEDER: I just make a concentrated effort to have somebody watch that elbow. I had a lot of trouble at first.

Two years ago I got the idea that I was throwing extremely low. For height, I put a pole vault standard out there just about the height I should throw to get 57 or 58 feet. I had to give that up because I was breaking too many cross bars.

MR. CALISCH: Where is the shot when the weight transfers from your front to your back foot?

BILL NIEDER: Just leaving your chin.

MR. CALISCH: Would you assume this position?

BILL NIEDER: As you are throwing your right foot does not leave the ground until

after the shot does, usually.

MR. CALISCH: I am interested in your weight being transferred.

BILL NIEDER: As I start to transfer it is still on my chin, about here (indicating).

MR. CALISCH: Doesn't O'Brien drop his shoulder and you keep yours up?

BILL NIEDER: Right. He brings his left shoulder down and over.

MR. CALISCH: You keep yours up?

BILL NIEDER: Yes, I just rotate. I have a twisting motion while he has a drive up and over his right leg.

From the Floor: Is the line necessary? Is it necessary to stay within one or two inches of that sort of a line? A lot of coaches draw a line right down the middle of the circle. Is that important?

BILL NIEDER: Like I say, my left foot goes sometimes right on the edge of the toeboard. I know that is a bad fault. For a good throw, for myself, if I can have my left foot in about a quarter from the toeboard, it is a perfect position. If I get further over my hips are open so much that I can't get the power that I need to get a really good throw.

All the rest of them, by hitting straight on, get a lot of drive over the right leg.

MR. GEORGE DEKAN: In high school coaching I believe one of the biggest problems is the right foot is actually off the ground when the boy is putting. I wonder what you can do; what type of exercise, or is it a problem elsewhere? You say the right foot must remain on the ground until the shot is gone.

BILL NIEDER: Right. As soon as it is leaving, it is coming off about at the same time.

MR. DEKAN: What can we do to have the boy do that?

BILL NIEDER: I would say that standing close is the best. Getting used to it and then reverse it rather than try to go across. They are hitting and jumping up in the air and holding. By standing in front of the circle they can develop that.

MR. DEKAN: Tell me this: Where is the actual pressure? Is it on your right leg, your left leg, or is it both? Can you tell me?

BILL NIEDER: O'Brien seems to come over his left leg. I don't put too much em-

phasis on that at all. It is all my right leg.

MR. DEKAN: When he is down, is it on the left leg?

BILL NIEDER: Yes. What would you say? Davis has a very similar form to O'Brien.

DAVE DAVIS: Sometimes he comes over too much. I think that is one of his major faults. He starts leaning back too much sometimes.

MR. WILLING: I have two questions. You mentioned driving from your heel with the right foot?

BILL NIEDER: That is correct.

MR. WILLING: Now; How do you land - - on the ball of the foot or flat-footed?

BILL NIEDER: Pretty much on the ball.

MR. WILLINGS: I heard an explanation of something - - I don't know if it is typical or something you do - - but it was about how you hold the shot initially in the palm and let it roll into your gfingers during the put.

BILL NIEDER: Itthink I am the only one who does that. I know Davis holds it as much on his fingertips as he can. I hold it here, and after I hit, I bring it up and it rolls up on the end of my fingers. I feel it is more of a spring action, I feel I get more power; more wrist snap.

MR. SEATON: Did you fellows talk about weight lifting? How do you work on snap? Do you just stand still and work on this or what?

BILL NIEDER: No, I do a lot of fingertip push-ups standing against the wall. I do a lot of those. I do maybe fifty or a hundred before I start working out.

CHIC WERNER: I would like to have the boys tell you about their weight-lifting exercises. I think you would be a little amazed at this. I know I was.

The first day we got here they were complaining to me about the weight setup. They are a great bunch of kidders and they said, "We will have to do something because the heaviest thing they have over there is 350 pounds," and they usually work out with the 500 pound stuff.

BILL NIEDER: That is Davis.

CHIC WERNER: I watched the workout and I was completely exhausted just from

watching it. I am going to tell you what they did. We will have them show what they did - - but this bar between the iron circles was bent when they got through. That is a pretty heavy bar. It is not supposed to bend. They said it was a faulty bar. (Laughter) How about that, Bill?

BILL NIEDER: Well, I start off on Mondays, Wednesdays and Fridays. I lift three days a week. I usually work pulleys so as not to strain or pull a muscle before starting out. I reach over and grab the bar in this position and bring it up as fast as I can to my chest (demonstrating). I usually start off with 150 pounds. I do five sets, five times.

CHIC WERNER: Would you go through one set?

BILL NIEDER: I pump this weight as fast as I can. It ricochets off of my pectoralis muscles there. I do everything with quickness in mind. That is one reason why I don't do standing presses because I feel it is too slow a motion for me. I do everything with quickness.

For the next exercise I am in this position here, and I throw it out as hard as I can five times (demonstrating). When I get through, I put it down. I start off with 150 pounds and I got up to 270 pounds with it.

From the Floor: Didn't you have an injury? Did you do that from weight training?

BILL NIEDER: No, I fatigued the muscle and that was the day I had, I think, 28 throws over 60 feet. I kept straining, trying to show how many times I could throw over 62 feet. It is a bad fault.

CHAIRMAN SNYDER: First, Dave, how many days a week do you do the exercises in mid-season, and how many days a week on shot?

DAVE DAVIS: I work out Monday through Friday with the weight lifting, and maybe once a week on the shot - - maybe once every two weeks. If I have the feel and I know I have the feel, I just won't work out with the shot; I just throuw it in the meets. If I know my form needs it, I will work out.

BILL NIEDER: I work out every day until the middle of the season, then I knock off on Friday.

CHIC WERNER: This is with boys who have worked out every day during the learning period and now that they are up in the higher bracket of competition, they don't feel they should work every day.

MR. IVAN E. BENJAMIN: (Freetown, Sierra Leone, West Africa) How many squats do you do?

BILL NIEDER: Up to the last year I didn't do any squats at all. I had a bad knee. I have started doing them now. Davis does quite a few of them.

MR. BENJAMIN: How many pounds?

BILL NIEDER: I had a squat of 500 pounds. The first time I had ever been over 320 pounds. I did it one time.

MR. STEALY: How often do you work out? You work every day with the shots?

BILL NIEDER: I work three days a week, Monday, Wednesday and Friday.

MR. STEALY: When is that?

BILL NIEDER: Year around I slow it down to two days a week when the season starts. I slow it down to two days.

MR. WILLIAM McWILLIAMS: Davis said he works out every day with the weights, but I believe he rotates his exercises so he only does the exercise three times.

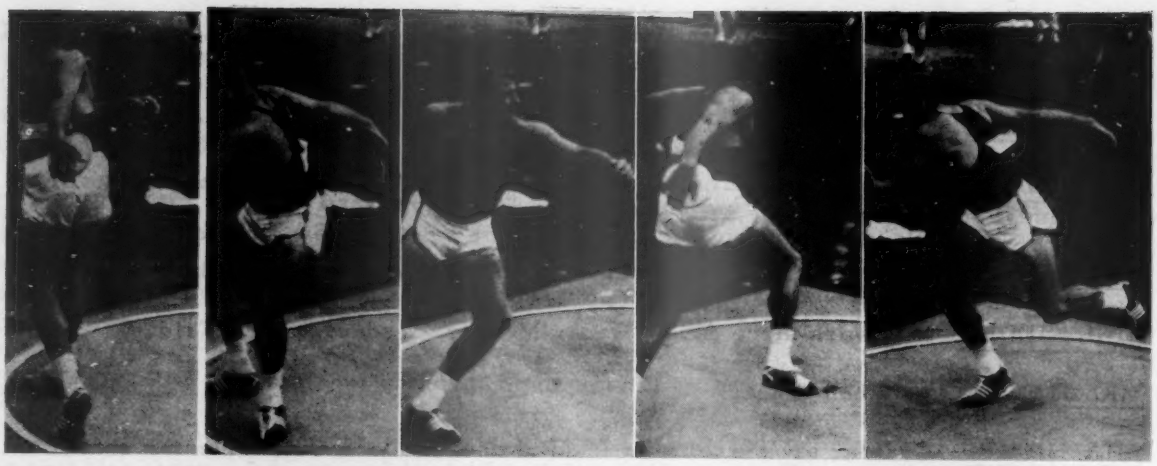
DAVE DAVIS: I work the lower half of the body one day and the upper half the next day.

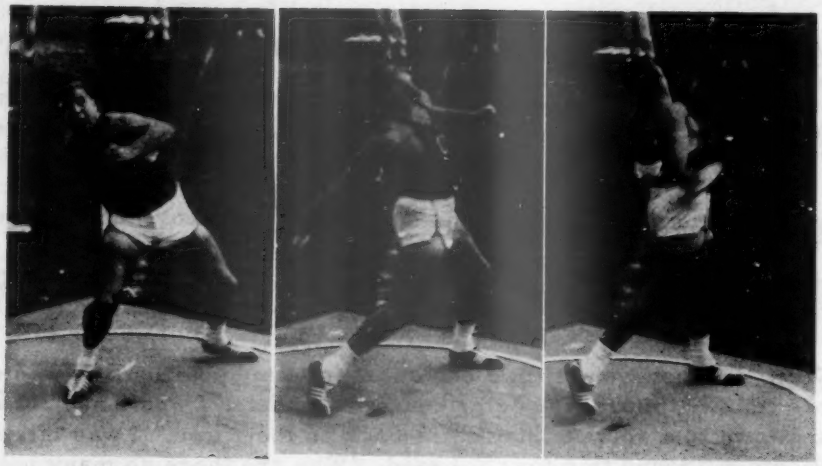
From the Floor: How many sets?

DAVE DAVIS: About a month ago I worked it up to eight sets of five with the last five sets at 430 pounds.

CHIC WERNER: I know you fellows can appreciate my position. I wouldn't say I am coaching these fellows; more like being coached by them, I would say. Last night I took them downtown to a show. They came back on their own. I was talking to one of the many policemen around this town. I said, "Why are there so many policemen around here?" He said, "This is a dangerous area. We had some boys beaten up and some murders."

I said, "We have some boys coming back from downtown." He said, "That is pretty dangerous." I said, "It sure is, but I don't think you know for who."





RINK BABKA

FORM ANALYSIS OF HAMMER THROWERS

By: Fred D. Tootell
University of Rhode Island

Illustration 1 of Felton, Illustrations 1 and 2 of Engle, and Illustrations 1 and 2 of Backus show the sequence of movements in the commonly accepted style used for the preliminary swings of the hammer throw.

FIRST TURN

The rotation phase begins after the completion of the last preliminary swing, (Illustration 1-Felton), when the ball of the hammer reaches a position directly in line with the center of the thrower's abdomen, and is extended as far away from his torso as possible without the thrower bending forward from his hip. Rotation consists of turning the torso 90 degrees toward the thrower's left (if he is right-handed) in conjunction with the same movement of the hammer head. The hammer head should maintain its position in front of the thrower's abdomen, on a slightly upward path, due to the fact that his right shoulder is slightly lower than his left shoulder. In this movement the thrower keeps his body slightly inclined in a direction opposite the position of the ball of the hammer. His left knee is bent slightly, with the rotation of his left foot taking place on his heel, and with the ball of his foot raised slightly from the circle. The thrower's right knee is bent more than his left knee, and his right foot rotates on the ball of the foot. This rotation phase is completed when the hammer head reaches a point 90 degrees toward the left from its position at the start of the rotation movement. The hammer head should be slightly above the level of the thrower's shoulder, with his arms fully extended. His head should be erect.

Illustration 2 of Felton, Illustration 3 of Backus, and Illustration 3 of Engle show the position that is desired just after the completion of the rotation phase and the beginning of the pivot phase. The arms of the throwers are well-extended; the hammer is slightly above shoulder level with its position directly in front of the trunk well-maintained; body weight is counterbalanced against the hammer. In these illustrations the left knees of the throwers are bent, with the balls of their left feet pointed in the direction of the throw and in contact with the ground in preparation for the pivot. It will be noticed that their right legs are just starting to be whipped around in a rotation of approximately 360 degrees. Illustration 3 of Felton shows the middle phase of the first turn, the pivot on the ball of his left foot, and his fully extended arms.

SECOND TURN

Illustration 4 of Backus, Illustration 4 of Engle, and Illustration 4 of Felton show the completion of the first turn and the beginning of the rotation phase of the torso and hammer toward the left, while both feet maintain contact with the ground.

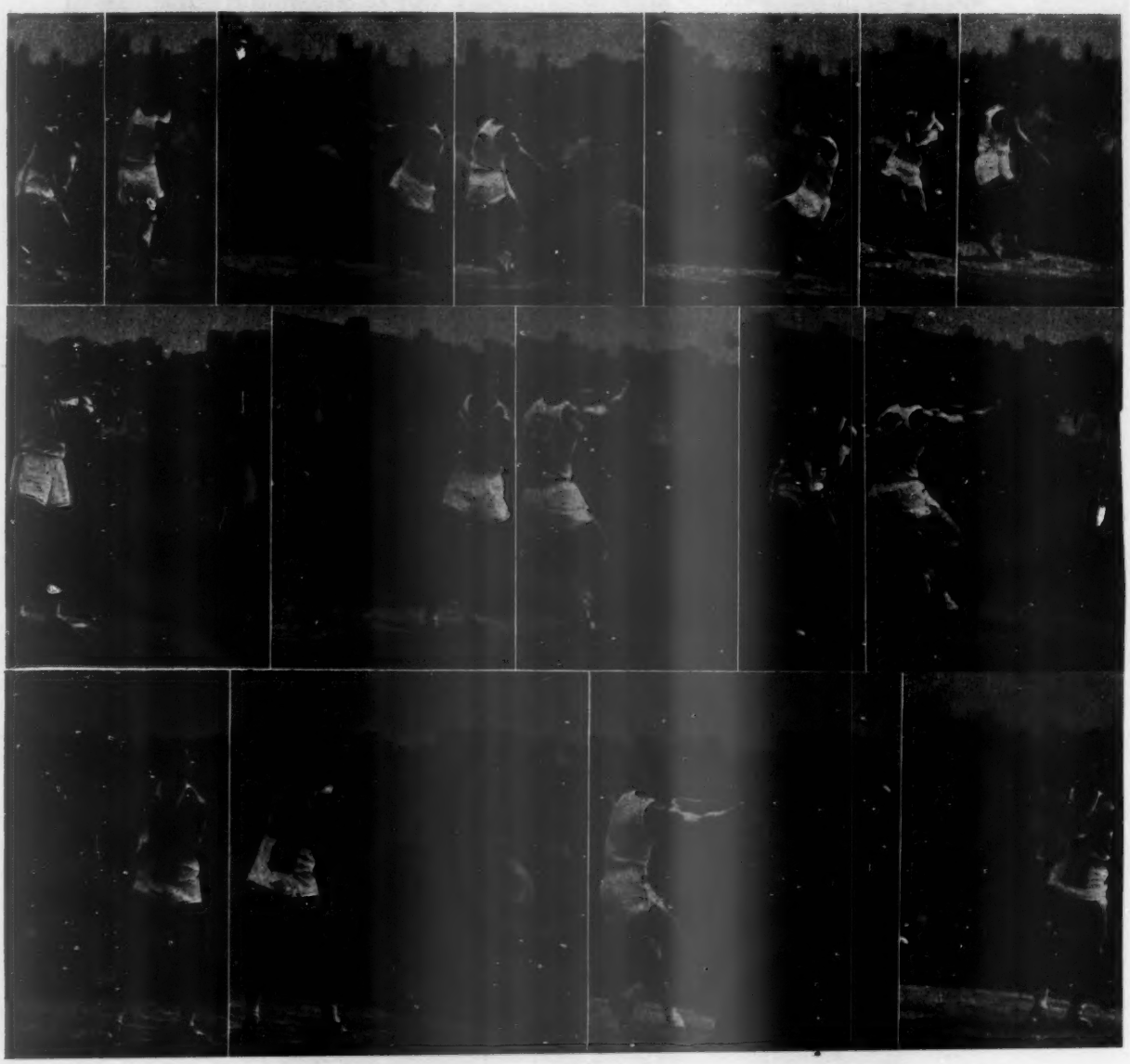


Illustration 5 of Backus, Illustrations 5, 6, and 7 of Engle, and Illustrations 5 and 6 of Felton show the second turn from the completion of the rotation phase, through the pivot on the ball of each thrower's left foot, to the return of the right foot to its point of contact with the circle. It will be noticed in Illustration 7 of Engle shows loss of body counter-balance in relation to the hammer, with the resultant loss of position by his right leg. This loss of position is undoubtedly due to Engle's very brief span as a hammer thrower, and is not his usual position.

SAM FELTON

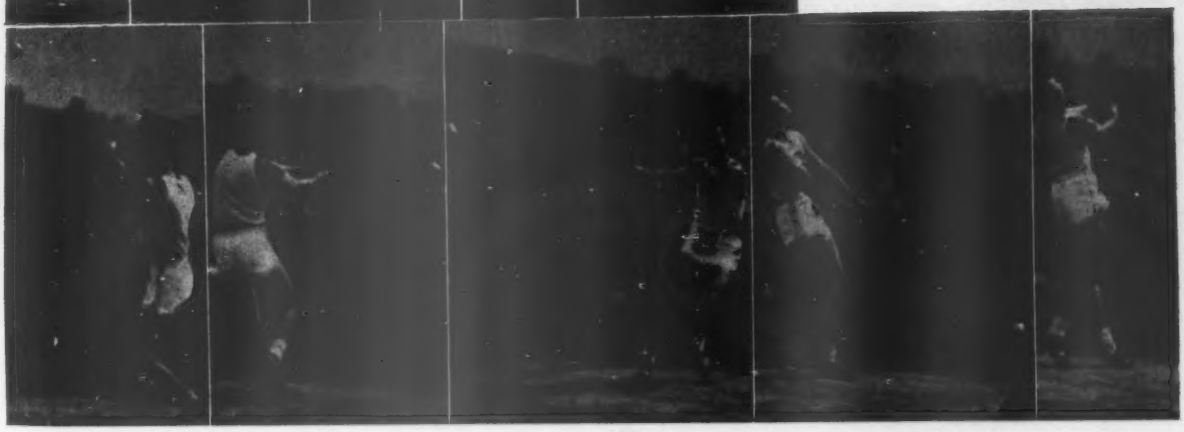
THIRD TURN

Illustration 7 of Felton shows the rotation movement preceding the last pivot. The position of his feet in this picture would appear to indicate a slight overshift of body weight toward his left foot. This overshift of body weight would be a fault if it were true.

MARTIN ENGLE

Illustrations 6 and 7 of Backus, Illustration 8 of Engle, and Illustration 8 of Felton show the various phases of the third pivot. It will be noted that the illustration of Engle shows he regained his body counter-balance which was certainly a great feat. Illustra-

BOB BACKUS



tion 8 of Felton indicates an incomplete third pivot which was probably caused by the overshift of his body weight which is shown in Illustration 7. We also believe that Felton shows an excessive bending of his left knee at this stage.

DELIVERY

Illustrations 7, 8, and 9 of Backus, Illustrations 9 and 10 of Engle, and Illustrations 9 and 10 of Felton show the delivery of the hammer after the completion of the third turn. Illustration 7 of Backus shows his position as his right foot contacts the ground at the finish of the third pivot. The hammer is well on the drag and his hip is sliding with good pull toward his left.

It will be noticed that as the ball of the hammer approaches a front position, the thrower's feet rotate so that they will point toward the left of his landing position, and his torso also twists toward the left. At this time the thrower's head is thrown up and back in conjunction with the complete extension of his legs, and the upward and slightly outward thrust of his arms. We believe that the position of Backus which is shown in Illustration 9 would be better if his left foot were flat on the ground instead of raised up on his toe.

It is very obvious that the key to good hammer throwing is for the thrower to obtain the proper degree of body counterbalance to the hammer head during the rotation phase which precedes each pivot, and to make sure that the hammer head reaches a position of 90 degrees left with fully extended arms, before the right foot loses contact with the ground for the pivot. Thereafter the length of the throw is simply a question of how big and fast the thrower is fortunate enough to be.

VIEWS ON THE HAMMER THROW

By: William McWilliams

Because I am sure that there are many people here who have had very little contact with the hammer, I am going to start out with a brief basic description of the fundamentals and, also, I would like to say that the points that I bring out here are not proven scientific facts. This is what I have chosen to believe is the best for the hammer. You may get a disagreement from Harold Connolly, Hall and Backus, and if you do, my advice is to stick with them - - Connolly in particular, because he is the one who holds the world's record - - not I.

The hammer is thrown by making two or three, or more, revolutions of the body holding the hammer approximately perpendicular to the shoulder in the 7-foot circle. The ball itself weighs almost as much as the 16 pound shot, with the exception that the handle is figured into the weight.

In other words, the over-all weight has to be 16 pounds or greater. The over-all length, from the tip of the handle of the tip of the ball must be 4 feet or less, and it can't be less then 3 feet, 10 1/2 inches.

In making these revolutions with the hammer the low point that the hammer makes in the air should fall approximately perpendicular to the plane of the shoulder and feet at the start of the throw.

You begin by facing, as in the shot-put - - well, actually I call it the front of the circle because it is the direction you start out facing. You start with the feet a little wider than shoulder wide. Most people start out with anywhere from 18 inches to 2 feet between their feet. The very first portion of the throw is the wind. The wind is important in order to get the plane tipped. In other words, if you just took the hammer and tried to start without winding, your place would have a tendency to stay very much horizontal, and this is not good.

As any good artillery man will tell you, the best angle to throw a projectile similar to the hammer or shot is 45° because, unlike the discus or javelin, it has no aerodynamic qualities. In other words, to get it tipped to 45°, or as close as you can come to 45°, you must wind it - - at least that is the only way I know of doing it.

The ball is placed about 2 feet behind the right foot of a right-handed hammer thrower. Then it is pulled from that position directly out in front of

the hammer thrower's face. Then his right arm rotates up - - his hands come up directly over the top of this head with the ball coming up over the left side and dropping down on the right.

It seems that the optimum number of winds is three. Some use two. Connolly used to use two, and now he uses three. You can use more if it suits the thrower.

There is on thing that I forgot to mention. The shoulders on the wind never turn to the left more than to the same plane that the feet are in - - in other words, back to directly facing the front of the circle. But as the hands pass over the head, the body turns so that the shoulders are about perpendicular to the plane of the feet.

Then, after the third wind with that amount of twist, the ball is pulled with the body, not with the arms. The arms are held as relaxed as possible. The ball is pulled with the body down in front and then started up on the left side. Then the turns are made and are called "heel and toe turns." In other words, as the ball approaches around, it is never allowed to get beyond perpendicular to the shoulders. Once it gets approximately perpendicular to the shoulders the shoulders begin to rotate with it. The left toe is lifted off of the ground and that toe is driven just by the muscles in your leg, and dips 180°, if possible, or as close as the thrower is able to attain.

The closer the thrower is to the 180° the better because he then has to turn only 180° more on his toe. The distance that he travels on his toe is purely coasting. He can't exert any acceleration on the ball and he is not supposed to try. That is the relaxed phase.

The foot is brought to 180° or more. From there, the body relaxes completely - - all effort to accelerate the ball ceases and you merely relax and let the hammer take you around and let your body fall - - just fall back towards the left side.

A hammer thrower has to have the feeling for opposing the tremendous amount of centrifugal force. In order to maintain equilibrium the hammer thrower always has to lean from 20 to 30 degrees or more off of the perpendicular, depending on his size.

By relaxing and letting his body fall he will drop into the proper position in the last 180° of the turn. By relaxing his arms he also allows them to pull back to less than a 90° angle between his shoulders and the ball.

In other words, here the ball is at an 80° angle and then here, when he relaxes, he just falls in with the ball dragging back a little bit so when he is in

here, he is again in position to sweep the hammer even faster on the next turn.

At the end of the third turn he lets go.

One of the major faults in the hammer, as Davis mentioned concerning the shot put, is the attempt by an inexperienced hammer thrower to sacrifice body position for speed. In other words, he doesn't realize he is sacrificing body position by trying to throw the hammer by means of accelerating it. He is very likely to sacrifice his ability to relax and fall in, with the hammer behind him. What he will do is to throw so that the hammer is never allowed to get behind him where he can really exert some force on it on the finish of the throw.

Centrifugal force is not the way to throw the hammer the farthest. If any of you have seen Connolly throw you have been fortunate in seeing someone who carries out this principle of relaxation to the Nth degree.

He pulls very hard but then has complete relaxation in the back half, allowing the hammer to drag way behind his body, and he is in a position to accelerate faster on the second turn and a great deal faster on the third turn. This is true, not because of any strength exerted through his arms, but through the twist he has generated by his body.

The same thing holds true at the finish. He is capable of getting a tremendous amount of torque with his body with which he throws the hammer 225 feet.

There is one disadvantage for hammer throwers which doesn't show up as obviously in the shot and discus and that is the handicap of being short. The main reason for this is that the ball will hit the ground. I am a relatively short hammer thrower and if I try to bend my legs like Connolly does and throw it at a proper angle, a 45° angle, the ball will hit the ground on my turn.

Mr. Nieder: Aren't you about the same as Connolly in height?

Mr. McWilliams: No, he is an inch and a half taller and Connolly has a shorter left arm. His left arm, which is the more important arm, is about 4 inches shorter than his right which is the equivalent of being four inches taller when the hammer is swung.

Mr. Nieder: Do you think that the shorter left arm is a hindrance?

Mr. McWilliams: In a way it is a hindrance because the radius is smaller but there are some people who think that it also works to his advantage, for two reasons: One is, Connolly has extremely powerful legs. By being able

to bend his legs more, he gains distance - - even though he loses because of small radius, he can bend more. He has strong legs.

Another thing is that the best way to turn with the hammer is keeping it directly in front of you. But when it is directly in front of you you would be unable to exert much torque at the finish. He can twist his body slightly - - in other words, he can have it 15 to 20 degrees farther around than I can. But I still think he suffers more than he benefits. His left arm is not as strong.

Mr. Werner: What about the position of your left hand?

Mr. McWilliams: The left hand is the one that goes on the bottom. The right hand is placed over it.

After the last turn the position of the body should be well on the left in order to be opposing this centrifugal force which the hammer on this side is exerting on your body.

One fault that many hammer throwers have is to allow them to fall off to the right-hand side and when they are pulling against all the centrifugal force they have no power. It pulls them off and it is similar to a puncher throwing a punch when he is not on balance. The weight must be over the left leg. As the ball comes around after the last turn the body relaxed and the ball comes down. The low point is about perpendicular to the plane of the feet, and then there is an extreme lift and explosion with the legs, the back and the shoulders. The hammer is released and your own momentum will at least bring you around.

If you have lifted extremely hard, as Connolly does, you come right off the ground.

I would just like to mention the weight exercises which are most beneficial to the hammer thrower, in the opinion of most American hammer throwers. They are the deep-knee bends, or squats, the rowing exercise - - I call it rowing exercise; - - pulling the bar up to the chest and back down.

Next are the cleans and jerks, or just the cleans, which is a lift directly from the floor up to the chest with as heavy a weight as an individual can use for about 6 or 7 repetitions. Not all hammer throwers do this one, that is, from the floor right up all the way overhead. It seems to me it is similar to the action with the hammer in the left arm.

After snatches, then dead lifts, which is mainly for the legs and back - - the two most important parts of the body for the hammer. That is a lift from the floor with a very heavy weight up to the standing straight position.

THE PISTOL FIRER

By: Willard N. Greim
Head Starter for the NCAA, AAU,
Olympic Tryouts, Pan American Games

I might say, in the beginning, that anything I learned about starting I learned from Hans Mueller, of Germany, who started the Olympic Games in Los Angeles in 1932.

I will try to make this starting seem very complex because I want you to think there is something to it. In reality, I am sure there is not very much to it compared to the running, but I have tried to approach this in an academic way so you would feel that it is a complex proposition.

Like most speakers, you know, we begin with the history of the thing and come down to the present. I didn't include the history. I will enumerate some of the things that are needed in the way of equipment. I do that only because I think it contributes to a comfortable attitude that is necessary for any starter to have.

I think it is necessary to use two guns. The rules say you must have at least a 32-caliber. I like a 38 simply because I have a large hand and I can get a good grip on a 38-caliber gun, whereas some of the 32's are difficult for me to hold and still feel comfortable. I think that the comfortable attitude is the predominating thing that a starter must have. Of course, your cartridges should be of a much better type than any of us have at the present time. They should show smoke during the daytime and flash at night. The black powder, of course, is the best. The smokeless powder is a nuisance.

There must be some way of signaling between the starter and the chief judge at the finish, or the chief timer, or the referee - - whichever official is handling the finish of the race.

The starter should carry two guns - - the other for the recall starter if he doesn't have one. Frequently he doesn't have one.

In Australia they had disks - - a red disk and a white disk - - and when the starter was ready at his end, they would show the white disk; otherwise the red disk would be shown, and the same at the finish. That makes for a quiet, dignified way of getting the job done. I don't know that it is more effective, but it is more dignified.

I think it is essential that the starter be seen, and some of us wear a sleeve of fluorescent cloth or a jacket or a cap. I think it is perhaps best to use all of those

things; then you will have no trouble having the timers locate you.

I have been using a reflecting board for the gun. It probably helps the timer. I fasten it on the barrel of the gun. The smoke is reflected on this. The timers indicate that that is helpful, and that makes it desirable.

Of course, the starter should have all kinds of clothing with him because you can't tell when you will have a good day or a bad day and you must have that comfortable attitude, not only mentally, but physically.

The clerk of the course is the important official in a track meet. He has to work closely with the starter. The clerk of the course will place the men on their marks in their proper lanes and then turn them over to the starter. It is the starter's function to give complete instructions to the runners. These should be brief, but complete, especially during the trials.

He should check the numbers of the runners and see that they all have numbers because when they get to the finish, it is too late to check that.

Before he attempts to start, he should see that the runners have their blocks properly set. I would say, if it is necessary, ask a runner to take an additional trial at the blocks to see that they are set, to clear suspicion that they might slip. It is much better to anticipate these things than try to correct them later.

Just prior to the start, I find it desirable for the starter to be in the middle of the track, and if the runners are ready - - blocks set and so forth - - to sound his whistle. Then he will have an answering blast from the chief judge of the finish or the official at that end of the track, indicating that they are ready. If they are not ready, they simply do not blow the whistle.

If it is necessary to change the signals after both have indicated they are ready, it might be done several ways - - frequently by crossing the arms below the waist.

It is essential that both ends of this event be ready. Otherwise there will be some difficulties. Then it is just too late to back up. You can't say, "We will try that one over."

Instructions, as I said, should be brief, but complete. Now that, of course, varies a great deal with the type of race you are in. If you are starting the U. S. A. - Russian Meet, it is difficult to give instructions that will be of any value to the Russians unless you speak Russian and I don't happen to be a linguist. I speak profanity proficiently; English passably, and I can understand if you swear at me in Spanish or French.

These instruction are essential because many times if you give the instructions

about the disqualifications to runners after they have had a false start, then you tend to disconcert the runner, and that is not desirable. It must be done prior to any commands.

The runners should know the distance they are to run; the number of heats; and the number to qualify in each heat. If it is a semi-final, the same information should be given, and the same information should be given if it is a final race. Tell them it is the final 400 meter hurdles, and you place 1, 2, 3, 4, 5, whatever it is. Or, it is a semi-final, the second heat of the semi-finals, and the first two runners will qualify.

Even with that information, there will be some runner picking his nose and he will not understand after the race is over that there are only two who qualify and he thought there were three.

You should warn the runners to stay in their proper lanes and ask them to run to the finish line in that lane, because that assists the judges materially.

I think you should warn them about interference when you are running races around the curve. I feel it is more important to warn them that they may be guilty of interference if they cause a runner to break rather than to think they should be two strides ahead.

The essential think is whether or not they caused the runner to break his stride or interfered with his running. I know the rules say two strides ahead. When you are running a race, I imagine it is difficult to tell whether you are two strides ahead of your runner to your left or right.

I think we should give the runners the information about the number of laps to run. If it is 3,000 meters, it is seven laps after you reach the finish line, which is at a certain place.

You should indicate where the finish line is located so that they will have that in mind.

In relay races, of course, you must be sure that the runners understand that they are to carry the baton all the time and pass it within the zone. We find it necessary to warn runners that their fingers must be behind the starting line and their feet must be in contact with the ground and not resting high on the blocks. I suspect that rule is violated more frequently than any other rule in starting. Of course, it is the starter who makes the mistake if it is violated.

Before the race, the runners should realize, understand and have been told that they will be disqualified after the second false start, and a false start will not be charged if a recall shot is fired, unless it is run under certain rules.

I think the most important thing about the warning is the runners shall be motion-

less. After they assume their set position, then they must be motionless. I think we have more difficulties between runners and starters in convincing runners that they must be motionless, because in spite of anything that is done, there are some coaches - (I realize they are not here this morning) - who advise runners that they can beat the starter, and by beating the starter, they may have an advantage that will win the race. I am sure that is usually the case if they do beat the starters. I am not saying runners have not stolen a start on me when I have been the starter. I am pretty sure they have, but starters should endeavor to avoid that under any conditions. If the runners become motionless in their position, they will not steal on the starter.

I think we should warn them that all runners that beat the start or cross the line before the starter says "Stand up" may be charged with a false start in International, AAU or collegiate competition. The intercollegiate rules do not make that mandatory. In fact, it isn't mandatory in any rule except for one man, and that one man that beats the start may be accusing of pulling the others off, but frequently he doesn't pull them off. They are going off practically in unison, so you may charge more than one runner with a false start.

The starter has the enviable position (if you want to think of it that way). The rules give him complete charge of the runners at the start. I think that is an important thing, that he have that authority. Yet I think he should treat it rather delicately.

Now, if one runner pulls off, and there is a perceptible time, the starter may say "Up". I think that is all that is necessary. If you say, "Now you fellows stand up," why, it is too late to do any good. If he says " Up" quickly, he can see the number of runners, but I think the runners should be there and warned that the starter is not there to save them. It is their responsibility to not move a hand or foot until the gun is fired. If the runner realizes that, then I think he will be in a much better position to finish the race.

I am sure all starters modify these instructions to runners with the event, with the place on the program, with the number of times he has started those runners and the type of meet it is. For instance, in the Pan American Games, you will not be able to give all those instructions. You just have to trust that these runners have been coached properly and know those rules.

In the first meet of the season, I think the starter can be very lenient and give the instructions in more detail, because we know that the coach hasn't had the opportunity to give all of these instructions to runners. The average coach has quite a few on his team and he is coaching everybody, from the shot put to the races; consequently, it is best to give the runner as much instruction as possible.

Now, so far as the commands are concerned, I think there are just three, and never more than four that are necessary. Sometimes you will find a runner who wants to approach the mark from a distance back. Foreign runners are frequently gathered

fifty feet back from the starting block and advance from that position. In this country, we expect them to stand just behind the starting blocks. Sometimes, frequently, we will say, "Stand at your marks", or, "Stand at your blocks", which is an informal command to get them ready to take their positions.

Then, of course, the first command that is prescribed is "Take your marks", and there we expect the runners to come in and take their position in the blocks - - their foot position, their hand position - - with one knee on the ground. However, many times you will find some runner who will not take the position. You have to guess whether he is in a comfortable position or not.

I think there should be ample time between "Take your marks," and the next command. The runner is in a relaxed position. He is not tense. If you accommodate the man who is slower in getting in position, I think you are doing the right thing. You always give sufficient time to allow the tense runner to get relaxed before you give the next command.

After considerable time, then the next command is "Set". There, again, it is a short command, but it is all that is necessary. The runners then assume their set position.

I think it is then the starter must be most alert in observing what is going on. If there are eight in the race, you have sixteen legs to watch. It is more important to watch legs than anything else.

There is no sure way of telling whether a runner is rolling except to watch him. The rules prescribe that they must be in position two seconds prior to discharging the gun. That is a long, long time for a runner. It is quite a long time for the starter.

But I think the most prevalent mistake made by starters is to feel that the runners are in the proper position after one second or 4/5 of a second, or 1 second and 5/10, or whatever it might be. But I find, even as placid as I am supposed to be - - all big men are supposed to be that way - - I have to wait longer than I think I have to wait.

If you are counting properly, you don't have an opportunity to watch the runners. I find it necessary to have some assistant to time that interval for me and tell me at the meet or in practice how long that is taking. To me, it is a question of judgment - - subconscious judgment, if you will. Rather than saying "One thousand one, one thousand two", it is, "Are the runners ready? And now we will shoot the gun."

After the gun is discharged, of course, there is noting to do except to step in the middle of the track and see that the runners are holding their lines, because sometimes that is essential evidence.

As to the position of the starter, it seems to me that I have started races from most every position relative to the runners. I think most of us stand too close to the runners. I like to be ten or fifteen yards in front of and to the side of the runners. Whether it is on the one side of the track or the other depends only on the timers and how best you may be seen by the timers.

In races having staggered starts, the best position is in the middle of the field. But usually the javelin is being thrown there. I came very near the point where the javelin landed one day, so I don't get out there any more. By being equidistant from the runners, you can see the runners better than you can at close range. So, for flat races, I like to be ten or fifteen yards in front of or to one side of the runners.

In staggered races, if you have a microphone, you can get in front of the runners and see pretty well - - I mean a microphone so each runner will get your voice about the same time. That would mean you would have to have outlets along the track to have it properly done. If you are tied into a public address system, that helps to overcome that handicap.

I think it is a handicap for the starter to be out in front or the starter to be in the rear. I don't know how to overcome that unless you put the gun out in the middle of a track, mount it on a stand and fire it by remote control. That is sometimes done, and very satisfactorily done, when you have some microphone outlets along the track.

I have some statements I would like to repeat. Some might be new. It is essential all runners get a fair and equal start. It seems to me it is just as undesirable to leave a man at the mark as it is to get some man up ahead. Now, whether or not you are going to charge a false start to seven runners who got off evenly in order to take advantage of this other man, who for some reason might not have been mentally alert or physically ready to go, is a broad question. I am of the opinion, though, that I would rather not charge a false start under those conditions. I would like for that runner to run the race. The rules are very lax on that particular point, but I think that the starter should use good judgment there.

Using this command "Up" at the start, I think, is essential, especially if you find one runner exceptionally nervous or two are exceptionally nervous when they are located side by side - - two opponents who feel "If I don't get a good start, I am going to lose the race." Perhaps by calling them up and starting over again, you can see that they get a fair and even start. If one runner is distinctly off balance, I would call them off rather than wait three or four seconds until he was in position to run.

If a runner takes an undue amount of time in coming up to the mark or getting in the set position after the command is given, then I think that is the time to consider the other runners in the race and give him a warning that you will disqualify him if he doesn't play fair. That is all it is, play fair.

If you feel he is, for some reason, not doing it intentionally, or if he hasn't been coached not to take an undue amount of time, then you can react accordingly.

I think after there has been a false start the runner should be told that he violated the rule and he is charged with a false start.

If the clerk of the course is there, give the number of this runner to the clerk of the course. If not, have pencil and paper and mark it down yourself. It might take fifteen seconds longer, but you will have a record of it. Make a record of it and see that he knows about it. You should speak to this runner quietly so he will have the information, but don't nag him about it and don't tell him, "If you do that again, you will be kicked out," because he is a nervous individual and, after all, it is his race. It is his show. You do have to be dressed up like an organ grinder out there so they can see you but that doesn't mean you have to act like an organ grinder. Be kind with that, "Joe, we will have to charge you with a false start there." That is all that needs to be said. It is difficult sometimes to do, but he should be relaxed.

Of course, you have to hold the gun over your head in starting the race. As I indicated earlier, I use this reflecting board on the opposite side from the timers.

One question that is asked me by lay people is, "What sort of cadence do you use?" Of course, anyone who uses a cadence is passe. You will not have command of the runners if you use regular cadence, I should say. It just cannot be done satisfactorily.

Your cue for giving the command "Set" is the runners are in position and ready to take the next position. Your cue for firing the gun is the runners are ready to run. It is not the case that I said "Set" so many seconds ago. Wait as long as you can with the runners in a set position so that all are ready to go.

I indicated that the runners must be motionless. That is the most important thing about the whole business.

The gun must be discharged from a cocked position always. I like to use two guns - - one for a recall. The gun you are starting with might be a double-action gun, but it is a piece of mechanism and sometimes it will fail. If you have two guns, your percentage of failure is much less.

Remember that these boys are running, and it is your job to get them started fairly. If a recall is necessary, you have to recall them. You cannot trust that to someone on the side. There is one thing I think I have forgotten. At the start, the starter must see that all the well wishers of the runner are back a considerable distance. There is always someone there to say, "Get 'em, Joe." Of course, if Joe hears them, that takes Joe's mind off his running and starting.

It is also necessary to warn the cameramen to be away from that particular area. If you know you can trust the cameraman to shoot after the gun is fired, that is perfectly all right, and no harm is done then, but it is much safer to have them a reasonable distance away. That is especially difficult with the movie cameras, because there is always a little whir there.

After the race is started, it is necessary to replace the old cartridges in the gun with good cartridges. Get into the habit of doing that all the time. You are liable to have a click with a defective cartridge, but it won't be your fault.

I hope you will pardon any personal references, but I don't feel I am a great starter. I feel every time I have the runners on the mark it is a challenge to me to get them off in an even start. I think you have to have a great deal of humility in this job, but humility without confidence is not of much service to you, so I think you must have a certain amount of confidence, and yet a great humility, because you have the best of these runners right in your little hand and their job out there is more important than yours.

It is easy to say, "Get the confidence of the coaches and runners and get a good reputation for fairness." I am sure you have to have poise, because poise exudes confidence on the part of the runners. You have to speak with a firm voice, yet you have to let the runners know that you are interested in their welfare.

If your shirt collar is too tight or if you don't like the way the stock of the gun feels, then you are not going to be calm; you are not going to feel easy. Those things are essential to poise.

I think you have to be prompt, because there is one thing that a starter is required to do and that is keep this meet running on time. I will not, however, contenance jeopardizing a runner for a two-minute delay in the track meet. In other words, if the runner isn't ready, I will wait two minutes and hope to make it up on some other event rather than to start the runner before he is ready. But the starter is charged with the responsibility of keeping running events on the scheduled time.

The clerk of the course has a big part in that but it is the starter who starts the race and he, of course, has to be charged with that responsibility. So you have to be aware of that.

Synchronize your clock with the referee's before the meet starts so you will be able to do the job.

There is one other thing - - don't be dependent for your livelihood on any fee that you might get as a starter. If you are, you are going to be less calm and you are not going to have poise. I know I have made great starters out of everybody, but I would be pleased to react to any questions you might have.

Mr. Benjamin: On the set position - - you have to hold the athletes as long as possible? I have seen starters hold the athletes unduly long. Is there any disciplinary action that could be taken against such starters, because the athletes are on their hands?

Mr. Greim: I think it is unreasonable to hold athletes as long as four seconds. After two seconds, then I think the starter should be ready to fire. I think the time should vary on the start between 1 and 9/10 and 2 and 5/10 seconds.

Usually, if you wait longer than that you get yourself in trouble. The only disciplinary action you could take against the starter is to get another one next time.

Chairman Snyder: We were thinking, Bill, of writing into the National Collegiate rules the possibility of taking away from the starter full control because the starters at so many meets have not been competent.

If the referee has no control over him, or the game committee has no control over him, then you just have a very bad meet all the way through.

We just asked the rules committee to consider it and see if there was some possibility of doing something to prevent a bad starter from continuing all the way through the meet.

From the Floor: For 1960 the National Collegiate Coaches Association starts will, in general, be in agreement with the IAFF rules.

Mr. Greim: I think that is quite desirable because many times the runners will raise that question when they shift from one meet to another.

From the Floor: How do you feel about assistant starters? I noticed you didn't say much about them.

Mr. Greim: I have no objection at all to an assistant starter. I think he is quite valuable, especially on staggered races because he can watch some of the back men. He can look at the hands on some of the lap races. I don't want a "yes man" if I have an assistant starter. I think those are the chief values of an assistant starter. Sometimes we use one at the first turn when they start flat where there might be some tripping that would cause you to start the race over. I have no objection to the assistant starter. I am always happy to have someone to talk to.

THE DUTIES AND RESPONSIBILITY OF THE TIMER

By: Phil Diamond
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I think we all agree that if we were looking for an ideal official as a man and as a person, we couldn't think of anybody better than Mr. Greim. Yet, in his talk, I think he left out the most important essential of good officiating (the essential he exemplifies most) and that is, the matter of character. When you see a man who has knowledge, who has intelligence, who has studied the rules and knows what they are about, who has wit, who has a sense of justice tempered with mercy for the competitor, who has humility - - that is my idea of a good official. He knows the meet is run for the boys and the rules have to be followed in order to make competition fair, and he exemplifies that in his every action.

I am an old crochety official. I am something of a nut on timing, as you will learn here. If I throw out a couple of ideas that prove the whole world wrong but me, forgive me.

Under ideal conditions the timer and his watch constitute a measuring instrument by which the ability of any runner can be quite accurately compared with the ability of any other runner, past, present or future.

Regardless of the level of competition, the realization and acceptance of this concept of timing places a tremendous burden of responsibility upon the timer. If he knows track as he should, he knows how much hard work, how much self-denial and how much self-sacrifice goes into the preparation for competition. His appraisal of an athlete's performance must be as expert, as objective and authoritative as that of a professor grading a student's final examination or a judge weighing the evidence which can change the course of a man's life. That sounds a little stuffy and yet I don't think it is belaboring the point at all.

To take away a record from a man who earned it because of an unfair, uncertain appraisal based on poor officiating is unforgivable.

Unfortunately, in matters of actual competition the conditions are seldom, if ever, equal. All factors are never quite identical. There is the matter of the competence of the starter. Recently I have seen some remarks made about Lauer's record in Germany. He ran :13.2. The consensus of opinion is that he got a flyer. It is possible; it might not be. I have seen that happen and so have you. So there certainly is the factor of the competence of the starter. We have the factor of the wind, which may

be negligible, which may favor the runner up to the permissible limit of two meters per second, or a wind in the runner's face, which would make the conditions unequal.

The quality of the track is another factor, and its condition on the day of the race is another.

To bring us to the point of this business, there is, of course, the question of the competence of the timing. There is no denying the fact that there is a substantial variation in timing. Here I will make the assertion, and it will not be an earth-shaking one, that poor timing is fast timing, and fast timing is characteristic of poor timing. The reason will be obvious as soon as I state one thing about it. It is easy to get fast time. All you have to do is be a little slow and anticipate a little at the finish, and world records come fast.

A good timer has good reflexes and this means reasonably fast reflexes but, above all, reliable and consistent reflexes. He has the ability, the self-control and the objectivity to make sure that the runner has run the full course before snapping his watch at the finish. It is not asking very much.

Again, I don't want to belabor the point because the starter has much more responsibility in a fair race than the timer has, but it is this matter of character. What kind of man makes a good timer? Let me paraphrase two different statements of the qualifications necessary in the NCCA rules, under Rule 5. (This is about inspectors, but it would apply equally to timers.) We are talking about the inspector, but let's substitute timer - - - "the timer should be the man best qualified by experience, as a competitor and as an official. He must know the rules. The inspector" - - - again substitute timer- - - "the timer should be former competitors or men or women who have closely followed track over a number of years. They must know what the violations are" - - - that has to do with inspecting - - - "good eyesight and must have no favorites." That would apply to all officials. In 1958, AAU Handbook, Mr. Parsons, of Northwestern University, under the heading of "Selection of Officials," gives the following two qualifications: "(A.) Knowledge, ability and experience of the official in the position for which he is chosen. (B.) His willingness to discharge the duties of his official position throughout the competition in the events with which he is concerned. Officials who insist on watching competition when it interferes with their duties or leave their posts unless absolutely necessary should not be asked to serve."

You probably have had that experience. You look for a man and he is under the stands. As far as I am concerned, when I look for one of my men and he is not around or a man checks himself out because he became too interested in a close finish, he is out. He is not asked again.

Your head timer should be a track nut, both from the standpoint of his devotion to track and his devotion to track records, world records and school records for all the standard distances. He is, so to speak, the custodian of those records, and he will

not be stampeded for any reason into subscribing to new records unless he is certain that the new record was made honestly, under fair conditions, in the same manner in which the old one was established.

When applications are made for records if you have any doubt about the record, that record should not be subscribed to.

When I started to think about this talk on timing the first thing I did was to review the rules. As you know, there are many areas in which the various sets of rules differ from one another.

Mr. Greim mentioned the one that has been the most important difference and that is the fact that in American races a break after the gun goes off is not counted against a runner whereas in the IAFF rules, the break is counted against the runner, regardless. There are other differences, some of importance and some not.

For example, under the IAFF rules, if a broad jumper falls out of the pit it is illegal. In this country we meaaure from the mark even though it is outside the pit.

In timing the rules don't vary very much.

There is another thing I want to mention about the recorders in the IFAA rules - - nobody is allowed to give intermediate times to the runners except the announcer. Under our rules, the head timer does it himself or appoints someone to give lap times.

I looked over the NCAA and also the high school rules and all agree on the basic elements. There should be three timers pre-designated, with one as head; also one or more alternates in pre-designated order whose time shall only be taken when one or more of the regular three watchers fails to get the time.

Personally, I like to have six timers working - - three regular, plus two alternates, plus one man who times second in all races. I like to have this later watch, and usually I use a good timer on it because in a close race, it is sometimes good to have him there.

His time can be compared with the space between the first and second runners, but, more important, it has saved the time, on occasion. In case of a disqualification of a winner the second place time becomes the winning time.

The AAU rules have much more to say about a timer's duties than do the others. For example, in order for a record to be acceptable, it must be timed by - - and this is accented - - approved timers with approved watches. Rule 18 says that each association should designate a reputable jeweler or watch maker in each of the principal cities as the official checker of timing watches to see that the watches are certified. As for the approved timers, the association is to prepare such a list and place it at

the disposal of the athletic associations in that territory.

Again, referring to the watches, Rule 50, Section 9 says that the watches must be examined at thirty-day intervals during the year.

Those are good rules - - no question about it. The only trouble is they are more honored in the breech than in the observance. There is nothing difficult about keeping a list of approved timers except it is a very, very difficult thing from a personal standpoint to review those lists every year and say, "So and so is getting old; his reflexes are not so good. We ought to drop him off the list." It is a little hard to do that. In fact, in our territory, we have the same timers practically all the time.

Chairman Snyder: Phil, can I break in a second?

Mr. Diamond: Yes.

Chairman Snyder: It is said the reaction time means nothing. If he is older and slower, he is older and slower at the start and at the finish.

Mr. Diamond: That isn't bad. The watch next to me is a very, very fine man who used to be a good athlete, a former head of the history department. He checks his watch out more often now than he ever did before. I mean, while his reaction to the gun, for example, might be consistent at the beginning and the end, he got to the point where he checks his watch out. I don't think a man should check himself out over two or three times a year. If there is anything more than that, you wonder if it isn't habitual - - in other words, one of the main virtues is consistency. It isn't so much the speed of the reflexes but the reliability.

So much for this business of the list. It is a perfectly good idea. A timer should be approved. The only watches I know of which are serviced every month, serviced regularly, are the Longines which we borrow for the big meets.

In the IAFF rules, under Rule 9, the rule on Olympic events is more realistic in that it specifies that time keepers shall use only watches tested and certified during the same year the games take place. That is easy to handle. The games are one-shot propositions, and it wouldn't be difficult to have the watches gone over in the proper manner.

How about the watches in regular use during our track season, being used for dual meets or conference meets from January through June? I hereby venture an estimate that over 90 per cent of the watches in use are of doubtful accuracy and reliability - - over 90 per cent.

At the University of Michigan we are quite finicky about our timing. We do what I consider an absolute minimum - - we have six watches, and we send them in to

the factory every Fall, and when they are returned, they are used only in meets. They are never used in time trials or practice.

If adjustments are necessary during the season, we have them made locally, but the watches come from the factory every September.

As for care of watches, I don't know how much there is to say. It is a question of how you people operate. However, if they don't run down by themselves, run them down after every use.

I distribute watches at our meets fifteen minutes before the meet starts, and let the men fool with them and run them and get used to the action of the finger to see how far the stem will go down before snapping, and so on. Five minutes before the meet, I call them together. We wind them, run them for the five minutes until the meet starts. They remain that way unless we tighten or run down an individual watch for a minor adjustment. In that way, we take care that all of the watches are exactly the same.

We keep charts of the names of the timers at every meet. We use a ruled chart and we keep track of the number of watches they are handed. If a watch is running wrong or a timer is running wrong, we can find it out after the meet. If one watch runs consistently wrong after being used by two men, it will be taken care of.

I know how many times they check themselves out during the year and which watches are running, and so on. I know this all the time.

I am coming now to a couple of other things and here is where the controversy starts. I have been in trouble before on this. Unfortunately, it isn't so much that my shoulders are broad as it is that I am old enough to be numb. I can take it. I will be interested in your reactions. A couple of questions have bothered me for years which have affected our timing at Michigan and probably few other places.

The rules are very specific in saying that the finish line is on the ground. It is mentioned time and time again - - the finish line is on the ground. The finish line is not a tape. The tape is put parallel to the finish line as an assist to the judges.

Okay. The tape is not the finish line. It is a line parallel to it. What does this mean? To my mind, it has a meaning, because there is no place in the rules where the finish is defined as such. When does a man finish a race? When does the timer snap his watch?

Now, the rule of thumb for the judges is a perfectly clear one: The men shall be placed in the order in which any part of their torso - - other than the head, the feet, legs and arms - - reach the finish line. But is that a definition of the finish? I, in my stubborness, say no. There are several things that make me think that.

Here is one: A man crouches on his blocks at the start of the race. The starting line is within the course and the starter and myself and clerk are very careful when he puts his hands down that he does not touch the line.

The finish line is inside the course. The man gets down in the block - - from here on he is over the line when he starts and he finishes the race without any part of the body being past the line. The rules say a man must run a full course - - not 99 and 1/2 or 99 and 1/3.

How can a man start inside the course with part of his body inside the course and finish with his entire body inside the course and still have run an entire course? It is silly.

Mr. Higgins: It states that all the body has to be across the line before it is finished.

Mr. Diamond: Right, except the judge places them in the order in which they reach the tape. One of the rules says they should call it a violation when hurdlers end up in that condition. That is tough, because we reversed a decision when a fellow broke the tape with his head. You probably have had the same thing happen.

Yet, the rules say the men should be placed in the order in which they reach the line. The very next line says a man falling or crawling must completely cross the line, including head, arms and feet before finishing.

My idea is simply this about the business of judges placing them in that order: That is a beautiful rule of thumb for judges which works, because if a man reaches the tape in running position, he is going to finish - - that is reasonable. With the guy who dives across, you are not absolutely sure until he finishes. But I still think the man has to reach the finish line.

At Michigan, we time that way. We have been bawled out for lousing up records. A certain gentleman from Cleveland wrote articles which were printed all over the worlds about Jesse Owens getting a raw deal. I was head timer that day. If he got a raw deal - - those records were made like every other record on the Michigan track. I have been timing for about 35 years. I learned the trade under the best timer I have ever worked with, and that is Steve Farrell. He is absolutely conservative. I used to take all his grief when I had the fast watch. After some years of apprenticeship, I was fifth watch, fourth watch, and I became head timer 25 years ago.

We time that way because that is our interpretation of the rules.

Three timers must time a record. What does it mean? Three guys named Joe holding watches? It turns out to be a rather odd thing. The rules are quite specific in that if two watches agree and the third disagrees, the No. 2 watch is taken. The mid-

dle time is taken as the official time.

How about applications for records? Just for example, as a case of fairness, suppose you have a race and two competent men will catch a guy in the 220 in :19.9 - - three guys, and two catch him in:19.9 and the other in :20.1 - - a record - - right?

Mr. Sober: Both the IAFF and AAU rules, while they require three timers, the record is perfectly all right both in the IAFF or World's Record, and AAU, for American records, with two watches, because I think you can explain with two watches. It is never possible to get a better time when you get the third watch. The rules specifically provide for records on two watches.

Mr. Diamond: That is perfectly good. I didn't know it. I am glad to hear it, except for one thing. The point I was going to make is not exactly that, but rather this: I, personally, would not sign an application on any but the slowest watch.

Mr. Sober: That is what I mean - - the slower of the two. You can figure out mathematically, no matter what the third watch may have, the only thing it can do is make the race slower, never faster.

From the Floor: How would you time second place if the tape is broken?

Mr. Diamond: We don't see the tape. The finish line is on the ground.

Incidentally, there was something I just happened to think of, and that is the business of timing the odd places. That certainly ought to be done, but that is one devil of a job. We had the National Collegiate in 1954. I had ten guys in the stand, and we threw away everything we had. You just can't be accurate from high up in the stands.

Mr. Higgins: Have a man over each lane, as you do in swimming.

Mr. Diamond: It is possible.

Chairman Snyder: Have metered lines on the track without trying to time.

The man who is timing can judge how far back of second place by use of the white lines put in front of the finish course.

Mr. Diamond: I think it would be more accurate than a watch high in the stands.

I was with an old gentleman - - you will know him well in the East - - Dr. Louring, who used to be at Minnesota.

Mr. Higgins: Fred Louring.

Mr. Diamond: He spends a lot of time looking over historical matters. He has a terrific autograph book. I was interested to see in almost every case the man wrote down his best performance. If he had a 1500 meter man, it would say " 3:46" after his name.

Dave Rankin told me after the races the man would go up to the referee and get their times tested, so a man could be proud of running even non-winning times. He could be proud of a 3:46 even if he didn't win.

We don't have ten good timers. I am lucky if we have six.

From the Floor: Longines has the photo-timer.

Mr. Diamond: Do they? Bulova used to have one.

From the Floor: It starts out automatically with the guy and takes a movie of the race.

From the Floor: That is perfection.

Mr. Diamond: No doubt about it, except for one thing. It comes with a big truck and setting it up on the infield presents a vision problem for spectators.

Mr. Sober: With the Bulova timers, unfortunately, the timing part was never quite reliable because there were human errors or mechanical errors, but as far as the places were concerned, they were almost invaluable. Do you realize the number of men who got wrong places because of the inevitable human errors over the years? It is fantastic.

For one reason or another, Bulova went out. Longines a few years ago was not acceptable - - it was all right, but the man would put his hand in the way, and it was not acceptable. The present one is, and they are using it at this meet. Abroad they use Omega. Bulova is coming back and is going to have that timing device and camera available.

THE NEW PAN AMERICAN GAMES TRACK OF 1959

By C. G. Jones, Architect and Engineer for
En-Tout-Cas Co. Ltd., Syston, Leicester,
England

It is now over fifty years since the En-Tout-Cas Co. Ltd., Syston, Leicester, England, first laid down a special semi-loose all weather surface for hard tennis courts and other sports requirements. These special surfaces have been laid down in most parts of the civilized world and we are now making the surfaces for hard courts and running tracks at the rate of more than one thousand each year. The construction of artificially surfaced running tracks as distinct from hard courts and grass had made little headway before the war. There were a few well-known tracks amounting to only a handful in England and some other countries, and athletics were more or less marking time without any great or marked development being noticeable. However, we did make some quite good tracks in the twenties and thirties. One of the most famous, and it is still in use, was for Loughborough College, Leicestershire, England where great progress was made in the training of athletic coaches, etc. This track became extremely well-known and the annual summer training school also became one of the best known athletic meetings in the United Kingdom.

Immediately following World War II a decision was made by the British Government to help the Amateur Athletic Association in their endeavors to obtain for Great Britain the first Olympic Games following the war. In 1947 the company, with others, was invited to try to develop a suitable top dressing to give a fast running surface which could be laid quickly and attain a high degree of consolidation, thus giving a fast track in a matter of days. The reason for this rather unusual specification was that a decision had been made to hold the games in Wembley Stadium, and the stadium was only available for a limited period. In effect it meant that the track had to be laid within fourteen days and be ready for athletics. Most previous experience on track construction throughout the world had shown that it was necessary to have a considerable period of time elapse-- several months or even longer, in fact-- for the track to become thoroughly consolidated and really fast.

We were, however, after extensive experimental work, able to solve the problem. Experimental strips were laid in competition with many other firms and track athletes were invited to test the various surfaces without knowledge of the individual firms involved in their construction. The athletes unanimously chose our surface as being the firmest and yet most resilient, and that was the surface laid down. Accordingly the company was entrusted with this important contract, which was successfully carried through. As details show, the track was particularly successful because it kept its hard accurate surface under wet and trying conditions which did at times occur during the games. There is no

doubt that the successful Olympic Games of 1948 in London released a tremendous pent-up demand for the development of athletics in Great Britain with the result that the company has been busily occupied ever since in putting down, in one part of the United Kingdom or another, running tracks which, in many cases, are now famous.

We were subsequently greatly honored with instructions from the Organizing Committee responsible for the Olympic Games held in Melbourne in 1956 to construct their track in the Melbourne Cricket Ground.

The company has at all times preserved a close liaison with the Amateur Athletic Association, and does its utmost to keep abreast of all the developments required by that body and is competent to carefully examine any site which may be considered by any club or other authority; to draw up specifications, to give advice generally and to quote for the installation of running tracks, not only in this country, but in any part of the world.

In addition to the aforementioned tracks, we constructed the famous running track at Iffley Road, Oxford University, England, where Dr. Roger Bannister ran the first less-than-four minute mile; the White City, London; Melbourne, Australia, Olympics 1956; Cardiff, Wales for the British Empire and Commonwealth Games; also the very famous world-record-breaking track at Santry, Dublin, Ireland; University Town of Kuwait in the Middle East; Cambridge University, England, and numerous other well-known universities, colleges, schools, clubs, etc. Of particular note is the performance on the track at Santry, Dublin when, in a precedent-breaking event, five runners in the same race ran an under-four-minute mile. So outstanding was this achievement that it has been described as the "Dream Track."

The early stages of development of the Pan American Track at Soldiers Field, Chicago, contract were carried forward by the company's United States Agent and Distributor, Markath Trading Company of Brooklyn, New York. As the company's sports architect, engineer and consultant, I visited Chicago in 1958 for discussions with the Commissioners of the Park District, the Superintendent, Engineers and also the organizing committee for the third Pan American Games. Inspections were made by trial holes, etc., at Soldiers Field to obtain information for foundations requirements. Then followed detailed estimate and specifications for our special surface. Preliminary acceptance of our estimate prepared at headquarters, Soldiers Field, was then returned to England where the final contract was finally signed and sealed by both parties. Work commenced immediately at the company's factory at Syston, Leicester, England to process approximately 480 tons of this special track material and fine top dressings. This quantity of material enabled us to lay down a full scale international track of 3" thickness on a specially prepared Clinker Ash foundation. The track lay-out consisted of a 400 meter circuit of seven 4' lanes with eight 4' lanes straight; also complete field events consisting of a 60' high jump semi-circle, long jump,

hop, step and jump and pole vault run-ups, a steeplechase run-up, independent javelin run-up and a separate training track. Also allowed in the quantity of material was approximately 50 tons of material for future maintenance with extra special fine red top dressing material.

While discussing the quantity of material supplied for this very large Pan American Track at Soldiers Field, we think it might be well to mention that tracks for colleges, universities, high schools and clubs can be constructed on a much smaller scale consisting of say, six 4' lanes and a six or seven 4' lane straight. This, together with the necessary modified field events and a surface of approximately 2" in thickness or slightly less, if required, would mean that approximately half the quantity of material of that supplied to Soldiers Field would be required. It can be well understood that this not only would reduce the cost considerably, but also reduce the cost of laying this modified specification surface. Assuming also that a reasonably well drained site is provided, a foundation of good hard gradded Clinker Ash or even stone with a small topping of ash, if Clinker is difficult to obtain, to a thickness of 5" to 8" would be sufficient. Each site does vary considerably and proper examination of sub-soils is necessary before we can advise on the matter of foundation, drainage, etc.

The St. Lawrence Seaway was completed by the time the material was ready and the consignment was delivered by sea directly to Chicago. All the material was packed into steel drums and dispatched from our factory at Thurmaston, Leicester by freight train from the company's sidings direct to Port of Liverpool and loaded into the S/S Fairhead. This boat was actually the second ship to arrive at the Port of Chicago through the new seaway.

The question most often asked is what this special material is and how it is made. The answer to this question is that this material which has been developed by us over a number of years is a trade secret, but we can say that it is a mixture of several materials nearly all obtained in the Midlands of England. All these materials are scientifically graded, crushed and mixed into the correct proportions at our factory and discharged through hoppers direct into storage bins, drums or bags.

It can well be understood that a surface such as this must meet all weather conditions in almost any part of the world, that is to say, it must stand up to extreme wet conditions or very dry, hot climates, etc. This track surface has proved itself to be quite fast and suitable for either. It is also resilient and firm and not too hard to cause muscle strain or problems of this nature.

Maintenance of this particular track surface, contrary to popular belief, is quite simple. All that is required once a new track is settled down is the usual watering, brushing and rolling and again, this depends on weather conditions and the use of the track. A nominal investment in a small tractor equipped with

track conditioning attachments keeps maintenance and labor costs to a minimum. (Further details on this conditioning "kit" are available from Markath Trading Company.) The company stresses the immediate use of any new track they put down because this has the effect of gradually bedding down the surface and properly consolidating it to the correct degree of consistency. To explain this a little further, we would stress the use of the track by as many athletes as possible a week or two before a full scale meeting. We also recommend the use of the maintenance procedure mentioned above, usually at the end of the day. Application of these recommendations will produce the fine surface required for full scale international or other track meets.

In conclusion, we wish to thank the Commissioners and Engineers of the Chicago Park District, and also the organizers of the Third Pan American Games for entrusting us with this important contract. With nearly all Pan American records "going by the board" and enthusiastic comments and congratulations coming from all quarters, the track has proved to be of the same excellence as its companion En-Tout-Cas tracks around the world. It is pleasing to know that every endeavor is being made to keep this new track at Soldiers Field where we hope that many future international, intercollegiate and other events will take place, including world competition.

TRACK SHOE PANEL - LINCOLN, NEBRASKA CLINIC

Bill Bowerman
University of Oregon

I know we are all interested in any ideas that can be brought out as far as shoes are concerned and we are lucky to have some men who are directly responsible for the manufacturing and retailing of track shoes here with us today. In addition, we have some coaches. I will introduce the panel first, and then we will get started.

First of all, Tom Elliott, Vice-President of Rawlings and of the American Sports Equipment Manufacturers Association; Homer Weidmann, in charge of shoe manufacturing from Rawlings; Don Rossi of Spaulding; Mike Close, with Goldsmith, in charge of school and college sales and from Wilson, Ed Reutinger, Director of school and college sales, also with him Don Toussant, Manager of shoes.

The coaches on the panel are Don Canham, from Michigan and our old friend Karl Schlademann, retired track coach but still in the track business representing Adidas of German.

Mr. Bowerman: Gentlemen, the reason that I put myself on this particular panel is that for the last five years I have been making a study on shoes. I have corresponded about shoes with our fellow coaches and finally started making a survey on shoes. We thought that instead of complaining, as we usually do, we would see if we could get the American sports shoe manufacturers to come in to discuss the matter. I don't know whether to say that they have accepted graciously or not because I think we have complaints to make and I believe they realize this. We hope to get the kind of action that we think we should have.

Weight is important to all of us and here are the weights of the various models. This is one way of getting into the subject. The weight in ounces of the Adidas at size ten was 6 1/2 ounces; Ridell, 8 1/4; Spotbilt was 8 1/2; Spaulding was 9 ounces; Rawlings was 9; Law of London was 7 1/2; Puma (German) was 7 ounces. I did not have a Wilson. Peco was 7 1/8 ounces.

Question: Bill, do you happen to know the model of shoe that you weighed?

Mr. Bowerman: The Adidas was 143 and I have it in my records. I'm sorry that I didn't include the exact model of the shoe.

If I may digress a bit, the American shoe manufacturers have lost the market

and, of course, I think they are interested in why. We are interested in the best light shoe possible for our men; but I would prefer if you people would express yourselves from the floor when we get through with our comments.

All of you know Don Canham, who has had some great athletes and has done a lot of things with equipment that are beneficial to track and field.

Don, do you have some comments to make on shoes, please?

Mr. Canham: I think it would probably be the best thing to let some of these gentlemen talk. The only thing I would like to point out is that I think we all agree that we want a light shoe, and we want one that holds up a little bit.

I have talked to a lot of manufacturers and they say that can't be done. When you sacrifice weight, you sacrifice durability and I would like to hear what the fellows here have to say about it. Does anybody want to talk about that?

Mr. Elliott: I will start it off.

Mr. Bowerman: This is Tom Elliott, Chairman, or President, of the American Manufacturers Association.

Mr. Elliott: First, I want to say this is a fine opportunity to have a chance to come here and meet with you fellows. We meet with the football coaches and basketball coaches here and there, but I think this is the first time that we have had a group together to meet with the track coaches. And we do appreciate the chance to come and visit with you and hear your comments. We came here to learn.

Now, as many of you know, this all started when a group of coaches sometime ago made a statement that the American track shoe manufacturers have not kept up with the American coaches and American track athletes. We thought there was a possibility that it might be true.

I think it is most important that you get some people here who actually manufacture shoes to hear these things. Actually, we have two people here who are concerned with actual construction, with following the shoes in the manufacturing process. I think we have two people here in Don Toussant of Wilson and Homwer Weidmann of the Rawlings Athletic Shoe Company who know shoes in and out. I think that they, rather that the rest of us who are in the sales departments of the various companies, can evaluate your suggestions and perhaps give you answers directly as they come up.

For that reason, I think it would be well to direct the questions at these men so they can explain what you give and what you take if you want durability; what you put into a shoe if you want lightness. They will tell you the degree to which you must sacrifice this feature or that feature.

I had an interesting experience just a few days ago. A boy in the service now at Scott Air Force Base came over. He is a good quarter miler, he runs under forty-eight, and he had a pair of Adidos shoes which he bought in Germany about three months ago. He came in with a bent spike and wanted us to fix it. Well, we explained that there was nothing we can do with that spike because we could only cut it off for him or put a new sole on the shoe. That was why the American Manufacturers for the last fifteen years at least, have been working under the illusion that the fine features of a track shoe was a removable spike.

Now we are here today to learn to what degree a removable spike shoe is desirable and what degree of weight and various weights is desirable, because we can make any weight shoe that is being made. This import thing is a very serious question and I spent two days in Washington last week in regard to imports on baseball gloves and tennis rackets and things like that. We are anxious to make in American the finest track shoes that are made anywhere in the world.

Mr. Bowerman: Thank you, Tom. Tom has opened himself up, I think, for one question right now and that is; would someone from the floor like to ask a question regarding removable spikes? Tom indicated that is the most important feature in a track shoe. So does anyone have any comment on that?

Mr. Best: I am Riley Best, from Wisconsin. I think it depends on what part of the country you are from for one thing. In the middle west, of course, we run on clay; in the wintertime on the boards; have our outdoor season along with it and three different sizes of spikes. To me, the only economical thing for us to buy is the removable spike shoe. We don't buy any permanent spike shoes at all any more and I think it's a matter of opinion whether you should have to have removable spikes or not. We certainly do in the middle west, and I think I speak for other middle westerners.

Mr. Bowerman: Well, Riley Best has indicated that what Tom says is correct, the removable spike shoe is basically the only shoe.

Mr. Eastment: (Manhattan)

In connection with Riley's comment I would like to put forth another opinion. I wouldn't have a pair of removable spikes. It's thought they were economical and it turned out just the opposite because of the difficulty you had with changing the spikes and the bending of the spikes. We run on the boards all winter long and then on cinders the rest of the time and I use two different shoes - both with fixed spikes. Is it possible to make a light shoe with a removable spike? I can't see how it can be done. I want a light shoe.

Mr. Bowerman: Let's let one of the shoe men answer that.

Mr. Weidmann: I think, generally speaking, this matter of durability

and lightness are two different horses that you can't ride at the same time.

In the construction of a removable spike you have to have the bushing, you have to have the steel plate to house that bushing to secure it in the hole, and those elements bring weight.

Now you can reduce somewhat the weight of the steel, you can reduce with the newer metals the weight of the bushing, but those reductions are very minor. I think my original statement would still apply; that if you want a durable shoe with removable spikes you have got to sacrifice some weight. How much weight? I would guess that you would have to sacrifice this target of six ounces per shoe, per half pair.

I was interested in Mr. Eastment's comment about the removable spike bending. Most domestic-produced track shoes carry in the removable spike a hardened steel. It is a much harder, it has a higher rating on any Rockwell tester, than your non-removable spike which is often a cast affair.

Mr. Eastment: Pardon me, I think I created the wrong impression. The spike, itself, did not bend. It was the bushing inside that bent and, naturally, the spike, from my experience, itself hasn't bent. The plate of the bushing, as you call it, inside has bent over.

Mr. Close: The type shoe you were using; was that bushing anchored in the steel plate?

Mr. Eastment: I couldn't answer that.

Mr. Close: If it was anchored in the steel plate you wouldn't have that condition arise.

Mr. Canham: You mentioned that it is impossible to have a light shoe with a steel plate. Have you done any experimenting at all like Adidas has with the fiber plate, plastic, or fiberglass plate? Adidas has this football shoe, which is the latest shoe on the market. My understanding of it is that it has a fiberglass plate in it to eliminate weight. How well it holds up, I don't know, and I was wondering if any American shoe manufacturers have done any experimenting with lighter weight plates?

Mr. Weidmann: Yes. Yes, we have, Don. We started out with a nylon plate with the threads molded into the plate. It has not been perfected as yet. Now the Adidas red fiber plate in the track shoe does not require, or rather, it cannot do the job which we are speaking about of holding a bushing. Those non-removable spikes that are used in the Adidas red fiber plate are riveted on with four rivets at the base of the spike, and that bushing does not go through that fiber plate.

That fiber plate would not be strong enough to hold a bushing for a removable

spike. Where they use a removable spike construction in the Adidas, they have got this steel plate.

Mr. Bowerman: I would like to raise a question. I don't think we have gotten across to the manufacturers one of the things that seems to be important as to why we buy a foreign shoe.

How many in this audience prefer the fixed spike shoe?

How many prefer the removable spike shoe?

Voice: Qualify that. We would all prefer the removables if we would get light weight.

Mr. Bowerman: Well, if you could get the weight. Of course, the thing I tried to bring out here from the results of the questionnaire was that for competitive schools we think that toughness and lightness were the two most important factors.

I might qualify that again. How many of you prefer a removable spike shoe for practice?

About 35 out of 100.

Voice: I would like to know what the college coaches mean by durability. For instance, I buy 72 pairs of shoes, minimum, per year - with a fixed spike. Now what measuring stick are we applying to this word 'durability'? Five meets, 6 meets, and then throw them out for practice? How long do we think those shoes should last?

Mr. Bowerman: I think we answered the question on the basis of competition shoe as compared to practice shoe. We want a competition shoe to last through the competitive season and it is going to be worn at each meet. We want a practice shoe to last throughout the year. It may have a thousand miles on it.

Mr. Bill Ward: I would like to go back to Mr. Eastment's desire for fixed spikes. I think one of the reasons why I would agree with Mr. Eastment is because I find that the removable spike is very inconsistent. When you are on the boards I have found that many of my athletes have lost needles while participating in the race. They ended up with four instead of five, or five instead of six, and all of you coaches in here know the effect of losing a needle during a race. When the boy is on a track with fixed spikes and starts out with six needles, he ends up with six. Chances are that he might start out with six on a removable spike shoe and end up with five.

Mr. Larry Snyder: May I ask Mr. Ross a question? Do the boys ever tighten a spike until they break off?

Mr. Ross: They break out of the bushing and many times they bend in the bushing.

Mr. Bowerman: We have a question over here; George Dales, Western Michigan.

Mr. Dales: I think one of the most serious problems is the standardization of the threads. That is why a good many of us many times prefer the permanent spike because it is so difficult to get the right thread for the right shoe. You have the problem of changing them for indoor and outdoor, for boards, and so on. With the football shoes we have done it, we have standardized the thread but we still have to look all over the country for those particular spikes for our shoes. We would all like removable spikes if we could always get the right spikes.

Mr. Bowerman: Well now, just a moment. I think we should qualify, "we would all like to have the removable spike." I think we ought to find out whether that is so, because that is one of the important things that I thought came out of our survey. How many of those would prefer having the removable spike over a fixed spike?

Voice: If the weight is the same.

Mr. Bowerman: If the weight is the same, how many would prefer it if the weight is the same?

Voice: How are you going to make it the same?

Voice: It can't be the same.

Mr. Close: May I ask a question?

Mr. Bowerman: Surely. Here is Mike Close with a question.

Mr. Close: If we could make a removable spike meet shoe at 8 ounces or a little less than 8 ounces - - I don't think you will ever get a removable spike shoe down to 6 1/2. You might, I don't know.

Mr. Bowerman: Spaulding has a comment for us.

Mr. Rossi: I think one concrete recommendation that you men can make is the number of spikes and alignment. I call on a lot of people everywhere I go. In fact, I have a shoe here that was made because somebody wanted a 4-spike shoe and somebody else wants a 5-spike.

I daresay that 80% of you have an idea how the spikes should be placed on a shoe.

That throws a manufacturer a curve ball.

Mr. Bowerman: I would like to call on Karl Schlademann, who coached at Michigan State for many years. He has some ideas on just what you are talking about. Much as I hate to cut this short for I wish we had time for more from the floor; but let's let Karl take a few minutes here with his observations on track shoes.

Mr. Schlademann: I have been in this position many times before but never with this sort of a subject. I would like to say first that because I have a German name doesn't necessarily mean that my mother's name was German, too. Her name was McCarthy, so I am not selling foreign shoes because I am a foreigner.

Several years ago I brought the first two pairs of Adidas shoes to the middle west and, gentlemen, I brought them because I couldn't find a satisfactory pair of American shoes. (I was head coach at Michigan State at that time.) And the second year I brought about eighteen pairs and from then on they haven't bought anything else but Adidas and it runs to about $1,500.00 a year.

I have made a few notes here regarding removable spikes. I would like to say to the manufacturers here that the high school people are impossible to sell anything but removable spikes so they are going to manufacture removable spikes whether we want it or not.

We have had some trouble with the Adidas removable spike from schools that have field houses with very small tracks. I think whether American or German or Italian or whatever manufacturer makes these shoes has to furnish shoes for a real small track, he is going to run into trouble. I don't think you can make them hold. However, I wish to say this, that the Adidas people stood solidly behind their shoes. We have returned bushels of them and they have improved them.

The big reason why this shoe sells is not because I am a salesman; it is because it fits the boy's foot and because he likes them. When I first got these shoes I was very doubtful. I put them on two fellows and I couldn't get them off their feet. The second year we got 2 dozen pairs and I think the comment of Gosper, the quarter miler who most of you knew, was probably the most enlightening thing I have heard on track shoes.

I put a pair on him, he ran around the track, worked with them for about 20 minutes and he came back and said, "Coach, those spikes feel like they are growing on my feet like my toe nails."

And we use the slogan, "The shoe that fastens the spike to the foot."

Mr. Rossi: How about the spikes? The number and alignment?"

Voice: Do you use permanent spikes?

Mr. Schlademann: I use the permanent spikes. And I have the same kind of trouble that you gentlemen are talking about. Personally, if I was coaching one of your schools or my old school, I wouldn't buy one without a permanent spike. But, if you are out in high school and you have to buy one pair of shoes for three years you can't buy anything else but removable spikes, so there you are.

Now, with regard to spike placement. A great many years ago I designed a shoe, a 5-spike shoe and Spaulding made two pairs for me and I put them on two boys, both of whom were champions. I ordered them to size (they hand-built them) and I couldn't get Spaulding to make another pair. I don't know why that is.

Mr. Rossi: I will tell you the reason. It is the cost of making that shoe. At one time, let's face it, there have been more world records set with the Eleven TR than any other shoe made, but those men have died.

Mr. Schlademann: Or go back to the Spaulding two-zero which was the best shoe ever built by Spaulding. But those days are gone.

Anyway, I took x-rays of the athletes feet in these German shoes and Spotbilt shoes and any of them that didn't have these steel plates, and the spike beneath the ball of the big toe should not be present on any shoe. You put that spike there and that is where all your deep blisters come and all your trouble and I don't think it helps your athletes a bit. You want your grip on the outside edge.

I now have, gentlemen, a shoe sent back to Adidas with the spike placement I have asked for with three on the outside and two on the inside. I think that is a minor change. They have turned me down so far. They think they know more about spike placement than I do and maybe they do. They say the four-spike shoe is the shoe.

I didn't bring those x-rays with me, I didn't think this would turn up, but I have them and I would be glad to submit them and Don Canham can put them right in the notes if he wants to.

Mr. Rossi: Would you ask if they prefer the conventional type of a four-spike shoe? These men have been experimenting for years, too.

Mr. Elliott: Bill, I would like to ask Mr. Toussant a question. In your opinion, can American manufacturers make a shoe with the same construction features as the German shoe and maintain the same weight?

Mr. Toussant: Well, that is kind of a loaded question, Elliott, but I think we can make as good a shoe as any foreign made. I would say people over there

had a head start on us for some years. I would say they seem to have devoted more attention to it than we have. We are aware of our problems here. That is why a number of us are at this meeting. I think we can come out with a shoe with good detachable spike features that will come close to about 7 ounces.

Mr. Bowerman: Pardon me, did you say a detachable spike?

Mr. Toussant: A detachable spike, yes, close to 7 ounces. But I won't say that we will get down to 6 ounces. Now the difference between 6 and 7 is a lot in some instances and not very much in others, depending on what you are measuring. But I think that we can show a shoe like that. All American manufacturers (I am speaking for Wilson at this moment) can show a shoe around 7 ounces with detachable spikes.

Mr. Elliott: I would like to ask a question that I think has probably occurred to some of you. Do the American manufacturers have a closed mind to the fixed spike shoe?

Voices: No.

Mr. Toussant: I would like to answer that. I remember when I was breaking into this business there were nothing but permanent spikes, what we call permanent spikes. Slowly the evolution took place to detachable and we found ourselves sitting there one year with a large inventory of fixed, permanent spikes that we didn't know what to do with, and we had to throw them away. It suddenly changed, oh, right after the war, somewhere in there, it changed over.

We, as manufacturers had no ax to grind one way or another.

Mr. Elliott: Bill, I would like to get an expression as to how many prefer a 6-spike shoe, a 5-spike or a 4-spike. What the basis of preference is. We can learn something from that.

Mr. Bowerman: Manufacturers would like to have an answer to a question of what is your preference in total number of spikes.

So let's start with 6 and work down. Can I see the hands of all of those people who prefer a 6-spike shoe? Put them up high so we can count them out.

Six - a 6-spike shoe.?

Now, let's raise them way up so we can see them. Stan, is your hand up? Twelve.

Five - the 5-spike shoe?

Voice: May I interrupt a minute, Bill? I think there must be more than myself here who are not so much concerned with so many spikes as where the spikes are. I would say the way shoes are built now, I would be for about 5, but if you could get 3 or 4 properly place that would be adequate.

Mr. Bowerman: Now, let's find out how many would prefer a 5-spike shoe, raise them up high enough.

Twenty-one. And now the 4-spike shoe. Nine.

Mr. Elliott: Do they have any preference basically on cowhide as against a kangaroo.? I mean, they have had experience with both kinds of shoes, the variations in the leather. For awhile everyone insisted we make kangaroo college shoes. Now, most of the shoes that come in are a soft supple cowhide. Is there any preference one way or the other among college coaches for one type of leather or another?

Voice: What are the Adidas made of?

Mr. Schlademann: The top three models are kangaroo and they call the 146 150A a kangaroo, but not as high priced as the three top ones. They are supposed to be, - I don't know what they are.

Mr. Elliott: The popular ones we looked at are cowhide with a special treatment.

Mr. Schlademann: I think so, that is the 146 and the 150A, they are cowhide treated. But the real light ones are kangaroo.

Voice: I don't think there is any doubt but our boys feel Adidas is the most comfortable shoe.

Voice: I think that when a shoe has comfort then the ounce doesn't make any difference. The boy won't know it. He can run with that shoe and feel the way you said Gosper did. Give them the comfort of the shoe and then make it as light as you can. Give them comfort, give them room for their toes like Adidas. We cramp. You draw that leather back and the kids get blisters all across the tops of their toes. Now give them room up there.

Mr. Elliott Larry, when you talk about room - we have some lasts here we brought along. It would take too long to bring them up, but we know the displacement on our lasts of the American shoes and they are identical in width to German and Finnish shoes.

Mr. Bowerman: A question here.

Voice: We use, almost exclusively, Adidas shoes and I think of what happened to back up what Larry has said. Five years ago when Karl started to buy them he claims at that time that the German size was actually a different size, was maybe a quarter size away from the American size.

Mr. Schlademann: A half a size.

Voice: And the other thing is that our Adidas spikes bend. We have four or five bent spikes every week. The permanent spike will bend.

Mr. Schlademann: I think that is a bad batch of steel that the Germans have because today is the first time I've heard about it. Our shoes that we bought before our last shipment had real poor spikes.

Voice: We had it two years ago.

Mr. Schlademann: Well, we haven't had that trouble.

Mr. Bowerman: Do we have a question or a comment?

Voice: Before we leave the spikes, let's talk about flats for a minute or two.

Mr. Bowerman: Very good. I am glad you brought that up because with a number of hard surfaces what you are talking about for the weight man and possibly for the coming of the grasstex track and so on, the flat shoe is something that I think has been neglected.

What you mean is that it also has been neglected by the American shoe makes makers.

Mr. Close: I think, Bill, the statement is fifty-fifty. I know I have talked to a lot of track coaches about what type of shoe they preferred on that and I think I can give you fifty different answers and I think that is the reason we are in a quandary. What I mean, every coach has a different idea about it. I don't think that you people have decided what type of shoe you want.

Mr. Bowerman: In a flat?

Mr. Close: In a flat.

Mr. Bowerman: Don, what are you using for the weight shoe?

Mr. Canham: I have half-soled bowling shoes.

Mr. Bowerman: Which bowling shoe do you use? The rubber or the leather? The bowling shoe has two soles?

Mr. Canham: A "Cat's Paw" rubber corrugated.

Mr. Ryder: I am going to change the subject a little bit. I would like to ask these men, not these men; but representatives of the same manufacturing concerns about 13 years ago in Cincinnati. Is there any reason why the manufacturers can't get together and make a detachable cleat with the same socket?

Voice: No reason.

Mr. Ryder: They said they would do it then. Yet they haven't done it yet. If we could have a standardized socket and thread, as George brought out here a moment ago. It is an important matter.

REPORT OF THE ANNUAL MEETING OF THE N C T C A

LINCOLN, NEBRASKA, JUNE 12, 1959

President Canham called the meeting to order at 11:45. The first item on the agenda was the Secretary-Treasurer's report:

Phil Diamond: Gentlemen, the minutes of the 1958 meeting are included in the Clinic Notes. Some of you have received the Notes already; the rest of you will find them waiting for you when you get home. Since the minutes are in print, I would like your permission to forego the reading of the minutes at this time.

It was so moved, seconded and passed. Canham: The reading of the minutes will be dispensed with. Diamond: If, after reading them, you have any corrections to suggest, send the corrections to me and they will be made. Here is the financial statement as of June 6, 1959.

Received from Fran Dittrich, August 1, 1958	$2,012.62	
Less expired check returned (Dave Sime)	4.00	
Bank balance as of August 1, 1958		$ 2,008.62

INCOME

From memberships	$1,565.00
From sale of Clinic Notes	101.11
From All-American certificates	180.00
From Don Canham	500.00
Total receipts	$2,346.11

EXPENDITURES

NCAA dues	$ 25.00
Subscriptions to T & F News	1,005.00
Printing	437.23
Supplies, including stamps	72.42
U of M Film Service (HSJ article)	23.80
Ken Doherty (" ")	12.00
Bank charges (Stamp, checks & service)	4.35
Total expenditures	$1,579.80

Excess of Income over Expenditures	$ 766.31
Bank Balance as of June 6, 1959	$ 2,774.93

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OUTSTANDING ASSETS

Don Canham's Champions on Film - Clinic Notes
Renewal of General Mills contract

OUTSTANDING LIABILITIES

Don Canham - Clerical and other expenses, 1959	$ 59.65
Three subscriptions to T & F News	6.75
Two outstanding checks ($2.00 and $12.00)	14.00
Bill Bowerman (Postage costs on shoe article)	
Postage for mailing '59 Clinic Notes (429 @ 9¢ ea.)	38.07
Clerical help for mailing '59 Clinic Notes	
Printing costs of '59 Clinic Notes	
Travel expenses for Secretary-Treasurer	100.00

Canham: The next order of business is the report of the Auditing Committe consisting of Coaches Dittrich, Cretzmeyer and Best. Fran Dittrich will report as chairman. Dittrich: We have checked over the figures and find everything quite satisfactory. I would like to move that the Treasurer's report be accepted as read. Seconded and passed.

Canham: The next item of old business is a committee report. We have only one standing committee from last year and that is the Shoe Committee of Bill Bowerman. Bill, do you have anything further to add to the committee report? Bowerman: I think we covered it pretty well in the first session, Don.

Canham: Next, I'd like to report on the Mid-Winter Clinic. It was held in Cincinnati, Ohio. We had roughly between a hundred and a hundred and fifty there at various times, a very good clinic with quite a few new membership applications. I think we again proved that our Mid-Winter Clinics are very worthwhile, especially because we get into new areas and contact the high school coaches in that particular area. I might mention here that the next Mid-Winter Clinic will be held in New York City and I'm sure that the next Vice-President, whoever he may be, will set up a fine program there. So if anyone in your district asks you where the next Mid-Winter Clinic will be, you can tell them it will be in New York City early in January of next year.

Now the old business must also include a report from George Eastment on the Wheaties situation. As you all know, George has been active in the Wheaties deal since it began and when I was elected President last year, I appointed George to represent the Association. So, George, will you give us the report now?

Eastment: Well, there is nothing new to report. Through your president, Don Canham, the contract has been renewed and we will again receive the some of one thousand dollars. The Wheaties people request, however, that this request must be complied with, that we must supply them with the pictures of all the men who make the All-American team. This team, as you are aware, is selected by the Rules Committee and is transmitted immediately to the General Mills people. But the problem of getting a picture of each athlete and getting it to General Mills will require the cooperation of every coach, every school, which has a man on the All-American squad.

I would like to ask Fred Totell, the Chairman of the Rules Committee, or any other members of the Rules Committee, to let us know their coaches at the earliest possible date. As for the coaches, - most of us will be in Boulder - as soon as you find out send the boys back to your college or university asking them to send directly, not to the Rules Committee or to Don Canham, but directly to General Mills, a picture of the athlete in question. That is all, Don.

Canham: Here are two things we have done this year which will be of interest to you. We have made up two certificates, very similar to the All-American Track Certificate. I won't take the time to read them, but this one is a Certificate of Accomplishment to be presented to the past Presidents of the National Collegiate Track Coaches Association. You gentlemen who have served as president realize how much work is involved in this thing if you are going to do a job. The men who got this organization started, and men like Bud Winter, who put on the International Clinic, and the others who have really made a contribution deserve some special recognition. So we made this up and I think it is something that we all will treasure. However, we have one great problem - we don't know who all of them are.

What with the shifting around of the office and the records, we want your cooperation in letting us know who these past-presidents are. So, if you have been president of the NCTCA, please drop a line either to me or Phil Diamond and let us know when you served. And some of the others - like you, Brutus (Hamilton) - who have been around since the start, if you would give this some thought and try to recall some of the men who have been president in our early days. On most years we can do pretty well but we do have some spaces to fill in, and as soon as we get them we will print the list and have a permanent record.

Here is another thing; a Certificate of Appreciation from the NCTCA which we are giving to newspapermen, sports broadcasters, past secretary-treasurers of the Association and others who have helped further Track and Field in the United States. There are probably other areas that I haven't mentioned but I'm sure you can think of them. Once again, I think this is something that is very worthwhile, something that is going to be appreciated so that when these guys sit down to the typewriter they will think more kindly of Track and Field. We want to give these to men who have really contributed. We can think of many men on the Pacific coast and in New York and there must be men all over the country like that whom we don't know about. To make this successful we must have the cooperation of men from the various districts so I have appointed a committee to handle it. The Chairman will be Dave Rankin of Purdue; from the West Coast I would like to ask Payton Jordan to serve on the Committee; from the Southeast Percy Beard, from the Southwest Oliver Jackson and from the East Chic Werner. So if you gentlemen will just drop a note to Dave Rankin and let him know men in your area whom you would recommend for these certificates, we would appreciate it very much.

The last item I have is this: here are the new Clinic Notes, about a hundred pages, and we are going to sell it for two dollars and we hope to make a few hundred dollars on it. We know it will sell because it contains just about everything we have on hard surfaced runways. I know you guys are getting letters all the time, as I do,

about hard surfaced runways. So if you will refer them to the NCTCA, we will tell them everything they want to know and I think we can make a little money on that. There are other very good articles in the book, one by Bill Easton which I think is one of the most outstanding pieces ever written on distance running and another on the hop, step and jump by a Korean coach. So that is another item I wish you would remember.

This year we hope to be able to put out a Digest of all the Clinic Notes since our Association began. In our office we have the Clinic Notes from about fifteen to twenty years and some of them contain some amazing material. I can think of one, an interview, a question and answer period with Les Steers out of California on the high jump in 1939, I think, which is just about the best thing ever done on high jumping. So we plan to go through all these Clinic Notes, pick out what we think are the best possible articles - and there will probably be one or two from this session, certainly Larry's talk on the 440 hurdles - and put together another book similar to the International Track and Field Digest. As you know, we made several thousand dollars on that and we probably can do the same with the new book.

What I do need is your cooperation. If any of you has a pretty good file of the past Clinic Notes just drop me a line; if I could borrow one of the missing issues for a matter of a month or so it would help a great deal. That's all I have.

Is there any new business? Mr. Eastment, of Manhattan College.

Eastment: Gentlemen, at a meeting of the Advisory Committee, the Executive meeting held here yesterday at noon, a matter of vital importance to the Association was discussed and I have been asked to pass it on to you with the unanimous recommendation that the following matter be adopted by the Association at this time.

You have heard the financial report which shows a complete change over the past few years. We are no longer merely a social organization holding an occasional clinic, we are now a business organization dealing with sums of thousands of dollars every year. We are now actually in the publishing business, make no mistake about that, and we are growing numerically by leaps and bounds. Our paid membership is double what it was just a few years ago and I know the objective of the Executive Committee and the officers is to double that again in the next couple of years.

But so far, we have lacked continuity, that is, because of the rotation of the various jobs except for the Secretary-Treasurer, we have lacked a permanent place to keep our records and such. We need a central office and we need a responsible individual who will act for us in the interim between meetings as an executive Vice-President. Now this would not do away with the job of Secretary-Treasurer at all and

if you will bear with me I will make this as brief as possible. At the request of the Executive Committee I make the following motion: First, that Mr. Phil Diamond, our present Secretary-Treasurer, be elected as an honorary member of this Association. I wish someone would second that since it is the unanimous recommendation of the Executive Committee that it be passed.

Canham: You have heard the motion. Is there a second? The motion was seconded and unanimously passed.

Eastment: As Fran Dittrich, who served so capably over a long period of time will tell you, and as Phil Diamond is finding out more and more as he goes through with it, the fact that we are taking in more money means more work. We are no longer in a position where we have to ask men to spend their own money carrying on our business and we desire to spell out more precisely than it is spelled out in our present constitution the following matters: that the Secretary-Treasurer shall receive first-class round trip air transportation to the annual NCAA Track and Field Championships, In addition, he shall receive a per diem allowance of fifteen dollars for a five-day period each year. He shall receive one hundred dollars to cover his out-of-pocket expenses. In the past this has been largely absorbed by the officers, the Secretary-Treasurer, out of their own pockets. Over a long period of time they have written their own checks, used their own money when we were broke and couldn't pay our bills. This hundred dollars would be only a nominal sum - Phil Diamond said yesterday that he is reluctant to accept it - but we are looking forward to a couple of years from now when someone from among the coaches will take over that office and we hope to be in a position to spend more than that amount. I move the adoption of that motion.

The motion was seconded and unaimously passed.

And finally, in order to further the business of the Association, in order to take care of the growth of our public relations, in order to provide continuity in the office, in order to give the man who has been doing the work now for several years a title and proper authorization, we move that the office of Executive Vice-President be created to carry on the matters I have just discussed. I so move.

The motion was seconded and unanimously passed.

Eastment: I should have put into the motion that it would be understood that in order to help the establishment of this permanent office, the sum of two hundred dollars per year would be allotted to the Executive Vice-President for general office expense. At the time of the report of the Nominating Committee we will nominate a

gentleman for that particular office. That is all, Mr. Chairman.

Canham: Is there any other new business? (No response) The final matter is the report of the Nominating Committee which consists of Coaches Eastment, Jordan and Werner. George?

Eastment: The Nominating Committee has met and has not limited itself only to making its report now; this report has the unanimous approval of the Executive Committee. We submit the following slate:

For President,	Bill Bowerman of the University of Oregon
For Vice-Pres.,	Oliver Jackson of Abilene Christian College
For Executive Vice-Pres.	Don Canham of the Univ. of Michigan
For Sec'y.-Treasurer	Phil Diamond, also of the Univ. of Michigan

Larry Snyder moved that the slate be accepted in toto and Emmett Brunson seconded. The motion carried unanimously. The new president took over the chair.

Bowerman: Gentlemen, I thank you for this great honor and I do consider it a very great honor to be President of the National Collegiate Track Coaches Association. I certainly shall endeavor to carry on as did Don Canham, George Eastment, Bud Winter, Payton Jordan and the others who served so well in the past.

I'd like to mention one matter that I am particularly interested in. After last night's meeting it should be in the minds of all of us to try to come up with a plan whether or not to establish some kind of standards or perhaps regional competition as a method of putting the best men in the National Championships. Before these meetings are over, I hope to get through the Steering Committee the selection of a committee to present a plan as to how we can get our best men tinto the Championships; to qualify them in some way so as not to have to run as many events as we are now doing.

Is there any other business that should come before this meeting?

Question: Where is next year's meeting?

Bowerman: I understand the meeting next year is in Berkeley but I'm not certain on that.

Question: How is that established?

Bowerman: The recommendation goes from the Rules Committee to the Nation-

al Committee of the NCAA and they make the final decision. I will not entertain a motion that we adjourn.

The meeting adjourned at 12:40.

Respectfully submitted,

Phil Diamond

Secretary-Treasurer

1959
ALL-AMERICAN TRACK AND FIELD TEAM

100 Yard Dash	Roscoe Cook, University of Oregon Bob Poynter, San Jose State Charles Tidwell, University of Kansas
220 Yard Run	Lester Carney, Ohio University Ed Collymore, Villanova University Ray Norton, San Jose State
440 Yard Dash	Chuck Carlson, University of Colorado Eddie Southern, University of Texas Terry Tobacco, University of Michigan
880 Yard Run	Ernie Cunliffe, Stanford University George Kerr, University of Illinois Tony Seth, University of Washington
One Mile Run	Peter Close, St. John's University Richard Engelbrink, Penn State University Jim Grelle, University of Oregon
Three Mile Run	Miles Eisenman, Oklahoma State University John Macy, University of Houston Paul Whiteley, Kansas State University
120 Yard High Hurdles	Elias Gilbert, Winston Salem College Hayes Jones, Eastern Michigan University Willie May, Indiana University
220 Yard Low Hurdles	Hayes Jones, Eastern Michigan University Ernie Shelby, University of Kansas Charles Tidwell, University of Kansas
High Jump	Charles Dumas, University of Southern California Wayne Moss, Oregon State College Don Stewart, Southern Methodist University Errol Williams, San Jose State

Pole Vault	Jim Graham, Oklahoma State University James Johnston, Purdue University J. D. Martin, University of Oklahoma
Broad Jump	Ralph Boston, Tennessee A. &. I. University Darrell Horn, Oregon State College Ernie Shelby, University of Kansas
Shot Put	Dan Erwin, University of Oklahoma Ray Hiscok, University of Arizona Carl Shine, University of Pennsylvania
Discus Throw	Dick Cochran, University of Missouri Jay Silvester, Utah State College Bob Weise, University of Houston
Hammer Throw	Ed Bagdonas, U. S. Military Academy Eino Keerd, Boston University John Lawlor, Boston University
Javelin Throw	Bill Alley, University of Kansas John Londerholm, University of Kansas Buster Quist, New Mexico University
Hop Step and Jump	John Kelly, Stanford University Godfrey Moore, Winston Salem College Jack Smyth, University of Houston
3000 Meter Steeplechase	Gary Eliason, Brigham Young University Sam Holt, San Jose State John Macy, University of Houston
400 Meter Hurdles	Cliff Cushman, University of Kansas Dick Howard, New Mexico University Henry Wiebe, University of Missouri

Chosen after the N. C. A. A. Meet by the National Track and Field Rules Committee. The arrangement in each category is alphabetical, not in order of selection.